COAL AGE

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The Storage of Coal

CONSIDERABLE STRESS has been laid upon the advisability of storing coal as one means of helping out the present coal stringency.

The query at once arises, Why preach coal storage when the supply is already so scarce that there is not enough available in many cases to satisfy current demands? While this may be true under the present abnormal conditions, it should not minimize the importance of the reports received from many sections of the country of proposed storage plants. Inquiries for information regarding storage show that the recommendation of the Fuel Committee has been taken seriously by a great many producers and users of coal.

There is a wide difference of opinion in regard to the advisability of storing coal. It is the general opinion that coal deteriorates as a result of storage and that, therefore, storage should be resorted to only as an extreme measure.

The causes of deterioration are chemical and physical. In regard to the chemical changes, it has been shown conclusively by Professor Parr, of the University of Illinois, also by Porter and Ovitz in a bulletin of the United States Bureau of Mines, and by J. B. Porter, of the Canadian Department of Mines, that the chemical deterioration has been greatly overestimated and that with most coals this is an almost entirely negligible quantity.

IN regard to this phase of the subject, Professor Parr, in Bulletin 97 of the Engineering Experiment Station of the University of Illinois, just off the press, summarizes the data secured to date briefly as follows:

1. Bituminous coal can be stored without appreciable loss of heat values, if the temperature is not allowed to rise above 180 deg. Fahrenheit.

2. Indicated heat loss per pound of coal is due more to an increase in the weight of a unit mass of coal resulting from the absorption of oxygen than to an actual deterioration or loss of heat units.

3. Freshly mined coal has a large capacity for absorbing oxygen which combines chemically with both the organic combustible and the iron pyrites present, generating a small amount of heat; the rapidity of the absorption of oxygen depending upon the temperature of the mass and the extent of surface exposed—that is, the fineness of the coal.

4. If heat is thus generated more rapidly than it is lost by radiation, the mass will be gradually raised to the point where there is danger of its firing, the danger point being 180 deg. F., because at that temperature practically all the fresh moisture is vaporized and the rise in temperature is then much more rapid than before.

5. Any successful method of storage must check or prevent the absorption of oxygen, and any successful method of storage must provide for the radiation of heat due to oxidation more rapidly than the oxidation takes place.

6. Under-water storage prevents loss of heat values and is accompanied with deterioration in physical properties, such as slacking.

7. Dry storage is more safely undertaken if the fine material is screened out at the storage yard and sized lumps only stored.

THE engineering features of coal storage have not been so carefully investigated as have the chemical, and there are a number of important points in connection with the methods of storing and the mechanical handling of the coal that are open to argument. A few of these questions are as follows:

What is the best mechanical method of storing coal and reclaiming it from storage? What does it cost to store and reclaim from storage? Is there any limit to the time that coal can be kept in storage? Does it make any difference what time of the year coal is stored? Does it make any difference under what weather conditions coal is stored? Where should coal be stored—at the mine or near the point of consumption? Does the slight deterioration in chemical properties warrant any difference in the price between fresh and stored coal? What is the percentage of breakage in storing coal by different methods of handling? What is the best method of preventing the heating of coal in storage? If stored coal heats, what is the best way of handling the pile to put out the fire?

Many other equally pertinent questions will suggest themselves to practical coal men, and a free discussion of the subject is invited from all our readers. Send in your ideas today.

Ideas and Suggestions

To Find the Length of a Leather Belt by Weighing*

Put the belt on a pair of scales, get the correct weight, measure the thickness and width, and then lay the ruler across this chart twice and column *E* will tell the length in feet in a jiffy. The belt need not be rolled up neatly;

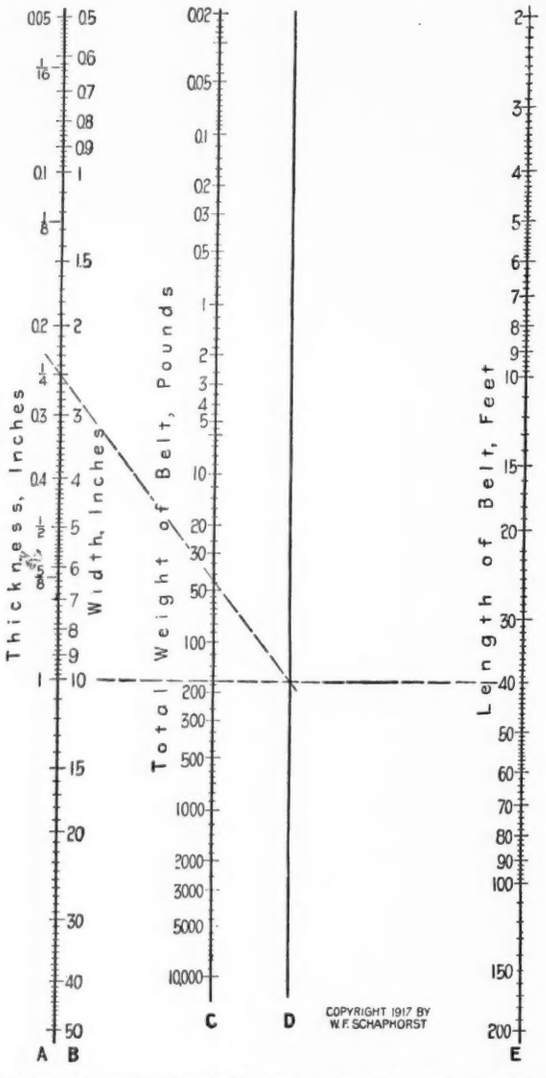

CHART TO FIND LENGTH OF LEATHER BELT WHEN WEIGHT IS KNOWN

it can be a jumbled up mess, as belts sometimes are, yet the scales will not lie. There is nothing miraculous about this method. It is based on the fact that leather belting weighs 0.035 lb. per cubic inch. So, knowing the width and thickness one can solve "backward" for the length. This chart does away with the figuring.

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For example, What is the length of a belt whose thickness is ¼ in., whose weight is 42 lb., and whose width is 10 inches?

Connect the ¼ (column *A*) with the 42 (column *C*) and extend the line to intersect column *D* as indicated by the dotted lines. Then run a line through that intersection and the 10 (column *B*), and the intersection with column *E* gives the answer as 40 ft. as the length of the belting in the rod.

When measuring the thickness of a belt, it is well to use considerable care, since a fractional part of an inch on this chart will make a great difference in the answer, as you may readily observe. If the belt is rolled up, measure the total thickness of ten layers. It is then easy to divide by 10. For example, if you find the total thickness of ten layers to be 2⅜ in., you know that to equal 2.375 in. Dividing by 10, the thickness of the belt is therefore 0.2375 in. You could not do much better with a pair of micrometer calipers even if it were considered desirable to do so.

The range of this chart is great enough to include all ordinary and many extraordinary belts. It is of service in a great number of instances where it would be exceedingly inconvenient to unroll the whole package of belting and put a tape line on it. Besides, no great amount of room is required to perform the operation.

A Safe Man-Trip

BY RALPH W. MAYER
Roslyn, Wash.

At its last session the Legislature of the State of Washington passed a new mining code. Under this law it is compulsory to have the first car of the man-trip secured to the socket of the haulage rope by an extra chain or cable of sufficient strength to hold the full load of the trip. Furthermore, each car must be connected to the one ahead of it by two or more connections, any one of which must be capable of holding the load.

At the No. 6 mine of the Northwestern Improvement Co. a special trip of cars has been made up to carry the men into and from the mines. For this purpose the regular mine cars are not used, a special car having been devised. The haulage rope is connected to the first car of the man trip by a short length of heavy chain, which contains a swivel. This chain is fastened to the end of the haulage rope in the ordinary manner, by means of a socket. The other end of the chain is provided with a clevis and pin that passes through the hole in the drawbar of the car.

The two arms of the clevis are embraced by a link that is hammered flat and welded fast to them about half way between the open and closed end of the clevis. This prevents the arms from spreading and also prevents the clevis from slipping off the link of the chain.

Two chains, one upon either side of the drawbar, are permanently fastened to the car, independent of the

drawbar proper, and in such a manner that either of the two secondary or side chains will hold the weight of the entire trip. These two chains are long enough to reach to the socket of the haulage rope. Each chain terminates at this end in an eye-bolt. These eye-bolts, one upon either side of the haulage rope, pass through holes made to fit them in a yoke that fits snugly on the socket. The nuts on the ends of the eye-bolts are pinned in place by cotters. The yoke to which the eye-bolts are secured is made sufficiently strong to hold the weight of the trip. For average use such a yoke should be made from about 2 x 3-in. bar steel.

The hole in the yoke is given the same bevel as the outer surface of the socket over which it fits. The length of the secondary chains and eye-bolts is such that when the haulage rope is taut the yoke is pulled onto the socket and held fast. On the bottom, or lower side, of the yoke an opening, or slot, is cut of slightly greater width than the diameter of the haulage rope. When the rope is slackened to uncouple the clevis from the drawbar of the car, the yoke can be pulled off the socket onto the rope and can then be lifted off, the rope passing through the slot in the yoke. This allows the yoke and secondary chains to be lifted free from the main haulage rope.

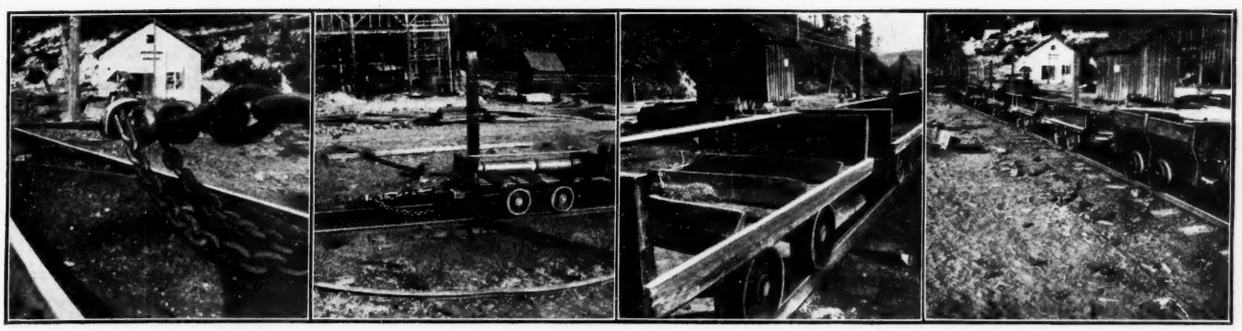
To facilitate the storage and operation of the man-trip two tracks are placed side by side. One is for the man-trip and should be under cover to protect the cars from the weather. The other track is for a trip of empty mine cars temporarily left thereon. The mine cars are run onto this siding and uncoupled, the rope then being fastened to the man-trip. When the men are all hoisted or lowered the man-trip is run onto its siding and left there until again wanted, while the haulage rope is then fastened to the empty mine cars standing on the adjoining siding, and the regular hoisting of coal proceeded with. These sidings are placed either inside the mine or above ground, or wherever most convenient.

The cars used in the man trip are constructed without sides. The ends are made from 2-in. planks about 14 in. high. These are bolted securely to angle irons, the other leg of the angle being bolted to the car bottom. These man cars are made strong to withstand rough usage.

A stay made up of 1-in. pipe, the ends of which are flattened, bent at right angles and bolted securely to the car ends, passes through the center of each car. This pipe not only strengthens the car but serves as a hand-hold for the men who sit upon either side of the car. It also equalizes the space that each man may occupy.

Pieces of 4 x 6-in. timber, cut diagonally so as to have a wedge-shaped cross-section, are used as cleats and nailed to the bottom of the car. Each cleat serves as a seat as well as a foot rest for the man occupying the seat behind it.

The first car in the trip is provided with a piece of heavy shafting running the full length of the car. This is placed in the middle under the pipe handrail and is securely fastened to the car bottom by means of U-shaped straps that are securely bolted at their ends. This piece of shafting is for the purpose of providing additional weight in order to hold the car on the track in case of ice, or should it strike some obstruction.



SOCKET YOKE WITH SAFETY CHAINS, THE FIRST CAR, A MAN CAR AND THE LAST OR TOOL CAR OF THE SAFETY MAN-TRIP

At the opposite end of the trip an ordinary mine car is placed. This car is used for transporting tools or any equipment that the miners may wish to take into or out of the mine. All the cars are connected together by ordinary couplings and side chains, any one of which is capable of holding the entire load that may come upon it.

Relation of Depth to Extraction

The depth of a seam limits the percentage extracted, according to a report rendered in 1913 by the chief mining engineers of the greater operating companies of the anthracite region. The percentages safely removable for given depths are given to the right of the table and the bed thicknesses on the left.

Bed Thickness	Depth Below Surface							
	0 to 500 Ft.		500 to 1,000 Ft.		1,000 to 1,500 Ft.		1,500 to 2,000 Ft.	
	Flat	Pitch	Flat	Pitch	Flat	Pitch	Flat	Pitch
2½ to 6 ft....	79	75	66	63	55	52	46	44
6 to 10 ft.....	75	71	63	60	52	49	43	41
10 to 14 ft.....	71	67	59	56	48	46	40	38
14 to 20 ft.....	68	65	56	53	45	43	37	35
20 to 30 ft.....	65	62	53	50	43	41	35	33

Mine Explosions and Fires

Immediately following a mine explosion or fire, company officials should act without a moment's delay. Dilatory tactics have lost many lives. First, summon the state mine inspector, rescue crews and doctors. Notify the power engineer, the hoist engineer and other local officials. Send an alarm to all parts of the workings. Station reliable men at all mine entrances to prevent any but safety lamps being taken underground. Allow no one to enter unless his name is recorded. Keep air compressors working and shut off all electric power except where such power drives a fan.

Location and Construction of Mine Tracks—I

By J. McCRYSTLE
Minersville, Penn.

THE gradual displacement of animals by mechanical haulage as the motove power in mine transportation, the successive increases in the weight of the locomotives employed and the improvements in car journals and rolling stock, admitting of longer, heavier trains at relatively high velocities, are making imperative a closer attention to the track material used in mines.

Short-radius curves are falling into disuse wherever traffic is at all heavy. These curves are frequently the limiting factor in the length of the trip. The long wheelbase of the motors is not adapted to them, they are the site of continual derailments, the haulage speed must be reduced at their approach, the cars cannot be pushed around them without danger of the bumpers "locking," their track maintenance is excessive, and altogether the use of sharp curves is questionable economy.

The introduction of the steel car for mine transportation also demands a higher grade of trackwork than was required for the wooden car; the deficiencies of the roadbed, to which the semi-pliant material of the latter adapted itself, tends to loosen the construction of the more rigid steel car.

With the more progressive mining companies, the old practice of building frogs, switches, etc., at the mine —to suit the conditions as they arose—with the crude facilities of the average smithshop, is being supplanted by the use of better-constructed commercial equipment, to which the curves are standardized. For it is obvious that the highest perfection in the design and quality of the material will accomplish little if this material is improperly installed.

With many mining companies, I have found, that after they are satisfied as to the merit of the equipment, the subject of trackwork is neglected, and the manner of installation and the specific application, the selection of the frogs, switches, etc., goes by default to the foreman or trackman. No efficient trackwork can be effected without some prescribed rules to govern this work.

Moreover, it will be found in endeavoring to compile a standard practice for the guidance of the trackmen, that while most textbooks and handbooks on this subject are replete with data on the standard-gage track, they are curiously lacking when applied to the narrow gages. It is necessary to delve through the many topics to find any data at all on the subject, and then often its treatment is intelligible to no one but an engineer.

With the foregoing in mind, the following series of articles has been prepared in order to furnish those in charge of the trackwork and the laying out of trackwork with the necessary data in a convenient form, compiled from the usages of several companies where trackwork has been taken up systematically.

The introduction of the rules in the latter part of the series is in line with the policy of the standard-gage roads to standardize practices and material, and fix definitely the responsibility for the various operations. The first part of the series deals briefly with the reasons governing the rules and the mathematical computations involved. The opinion that a mine car will run on any kind of track and that anything is good enough for mine work cannot be too strongly discouraged. Wellington and other authorities have been quoted.

It is hoped that a consistent application of the practices suggested will result in lengthened trips and lower haulage costs; easier, more economic track maintenance with a minimum of equipment in stock, and, finally, help to reduce delays in transportation ascribable to trackwork.

WITH the exception of gravity roads on the heavier grades where wood rail is still preferred on account of its higher coefficient of friction, standard tee rail is now in general use for mine tracks. In determining the proper weight or section of steel rail for any work, the type of haulage, the weight of the cars and locomotive, the spacing of the ties, and in some cases the reaction of the acid or sulphur water must be thoroughly considered. The approximate rules heretofore used in the determination of the rail section have usually erred in making the rail section too light. The severity of future as well as present traffic must be considered, since rail once laid is almost invariably utilized as long as the cars will travel over it, regardless of the increase in tonnage both of the trip and locomotive.

In computing the safe load for steel rail laid with 16 ties to the 30-ft. rail, 10 lb. per yd. for each 2240 lb. of weight on each wheel is usually taken; this, with an 8-ton four-wheel motor, would mean two tons on each wheel, or 20-lb. rail. This weight, while safe, is evidently not enough for any but chamber work—lightweight rail is a costly economy.

The flat wheels common to mine cars, the swaying side motion due to the play of the axles in the boxes and the side slant of the road bed, the inferior ballast allowing some of the ties to sink and causing the rail to span a number of ties, thus creating greater bending moments, the acid action of the water on the steel, the scrap value of any reclaimed track, the cutting effect on the treads of the locomotive wheels, etc., are too often forgotten in the purchase of rail.

Again, gangways or headings starting out with short mule hauls are converted to motor hauls, and later employed as main haulageways without any improvement in the original track. As a consequence, the rail becomes a series of humps and hollows, the maintenance of the rolling stock and roadbed is excessive, the road bed is rendered dirty by the car offal, the trips have few cars, frequent derailments occur, and the initial economy in the light weight of the rail is soon overcome.

As Wellington aptly expresses it, in buying rail "we must, unfortunately, use an intelligence somewhat higher than a hay scale." In rail we require: (1) Stiffness, (2) strength and (3) durability rather than tons of steel. If the strength of various sections is compared, it will be found that these requisites can be purchased at a lower unit rate in the larger sections. In "stiffness" we have that property which allows the rail to span the ties and support the load without bending, affording thereby a smooth running surface for the cars; in

"strength" we have that quality which bears the load without yielding or breaking, while in "durability" we have the ability to resist wear over extended periods of time.

The stiffness varies as the square of the weight, and the strength as the 3/2 power, while the price per ton is nearly constant. If the unit weight is assumed as being 30 lb. per yd., then the stiffness will increase as follows:

THIRTY POUNDS PER YARD—STIFFNESS = 1

16⅔ per cent. increase in weight 35 lb. per yd. stiffness = 1.36 or a 36 per cent. increase.
33⅓ per cent. increase in weight 40 lb. per yd. stiffness = 1.78 or a 78 per cent. increase.
50 per cent. increase in weight 45 lb. per yd. stiffness = 2.25 or a 125 per cent. increase.
66⅔ per cent. increase in weight 50 lb. per yd. stiffness = 2.79 or a 179 per cent. increase.
100 per cent. increase in weight 60 lb. per yd. stiffness = 4.00 or a 300 per cent. increase.

The ultimate strength will increase as follows:

THIRTY POUNDS PER YARD—ULTIMATE STRENGTH = 1

16⅔ per cent. increase in weight 35 lb. per yd. ultimate strength = 1.26 or a 26 per cent. increase.
33⅓ per cent. increase in weight 40 lb. per yd. ultimate strength = 1.54 or a 54 per cent. increase.
50 per cent. increase in weight 45 lb. per yd. ultimate strength = 1.84 or a 84 per cent. increase.
66⅔ per cent. increase in weight 50 lb. per yd. ultimate strength = 2.15 or a 115 per cent. increase.
100 per cent. increase in weight 60 lb. per yd. ultimate strength = 2.83 or a 183 per cent. increase.

The advantages of the heavy section over the light, as regards stiffness and strength, would show a higher comparison as the rail wears or wastes away from any cause whatsoever.

In determining the durability of rail, it is obvious that a great amount of wear cannot be expected if the

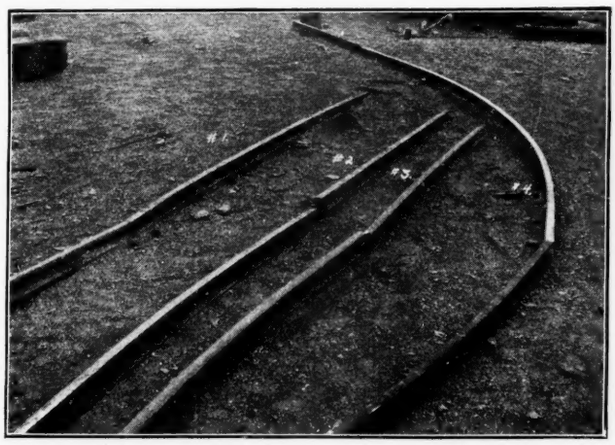


FIG. 1. SOME COMMON FAULTS IN RAIL JOINTS

weight selected conforms closely to the immediate duty it has to withstand.

We can assume for practical purposes that half the total weight is in the head, and that about half of this weight, or one-quarter the weight of the rail, can be worn away before the rail is discarded, if a sufficient margin of metal has been allowed; otherwise, the rail will fail before it has attained much more than a high polish.

In mining work, particularly underground, with the trackmen in absolute charge, trackwork, derailments, rail breakage, etc., are taken as part of the day's routine and pass unnoticed, except that part which appears indirectly in the high maintenance charges.

If we assume that a wear of ⅓ the weight of the head was allowed as a safety factor in the lighter rail, then the durability of light and heavy sections will compare as follows:

Weight in Lb. per Yd.	Weight in Head Only	Available for Wear: Maximum Half Head	Available for Wear: Minimum One-fifth Head	Left in Head After Minimum Wear	Spare Metal in Next Heaviest Rail Before Head Becomes as Light	Times Increase of Wear by Adding 5 Lb. to Section	Increase in Weight by Adding 5 Lb. to Section
30	15.0	7.5	3.0	12	5.5	1.830	1/6
35	17.5	8.75	3.5	14	6.0	1.710	1/7
40	20.0	10.00	4.0	16	6.5	1.625	1/8
45	22.5	11.25	4.5	18	7.0	1.550	1/9
50	25.0	12.50	5.0	20	7.5	1.500	1/10
55	27.5	13.25	5.5	22	8.0	1.454	1/11
60	30.0	15.00	6.0	24	8.5	1.420	1/12

Or, using 30-lb. rail as a unit, the metal available for wear would compare as follows:

Weight in Lb. per Yd.	Weight in Head Only	Available for Wear Before Head Would Become as Light: Maximum	Available for Wear Before Head Would Become as Light: Minimum	Increase in Weight per Yard
30	15	7.5 or 100%	3.0 or 100%	....
35	17½	10.0 or 133⅓%	5.5 or 183⅓%	16⅔%
40	20	12.5 or 166⅔%	8.0 or 266⅔%	33⅓%
45	22½	15.0 or 200%	10.5 or 350%	50%
50	25	17.5 or 233⅓%	13.0 or 433⅓%	66⅔%
55	27½	20.0 or 266⅔%	15.5 or 516⅔%	83⅓%
60	30	22.5 or 300%	18.0 or 600%	100%

Briefly, if we were about to build a permanent (so-called) narrow-gage road for mine traffic, for which 30-lb. steel would ordinarily be used, we would gain, by using a 60-lb. section, the economy in maintenance, a more easily operated road with its attendant benefits, fewer ties, fewer derailments and a larger scrap value when the rail was reclaimed. Furthermore, we would have a stiffness four times, an ultimate strength 2.83 times and a durability three to six times as great, for a rail expenditure but double that for 30-lb. steel.

Some concerns, by purchasing "second" rail from the railroad companies, obtain the heavier rail for the same price per lineal foot as for new sections one-half to two-thirds their weight. This quality of rail for most mining purposes will serve as well as new sections.

In localities where acid water abounds the corroding of the steel is frequently the limiting factor in the life of the rail. It would be futile to lay heavy section rail in locations where the water would soon destroy it. As the web and edges of the flange are the portions destroyed first, an inspection of the standard dimensions will evidence that by increasing the weight we do not secure a proportionate increase in the acid-resisting properties of the rail. Rail weighing 25 lb. per yd. has been taken as the basis of unity.

Weight of Rail	Increase in Weight, Per Cent.	Thickness of Web	Increase in Thickness, Per Cent.	Thickness Ends of Flange	Increase in Thickness Per Cent.
25	..	19/64	..	32/64	..
30	20	21/64	11	32/64	..
35	40	23/64	21	32/64	9
40	60	25/64	32	32/64	27
45	80	27/64	42	32/64	35
50	100	29/64	47	32/64	36
60	140	31/64	63	32/64	64

In the standard tee rail, adopted by the American Society of Civil Engineers, 42 per cent. of the metal is in the head, 21 per cent. in the web and 37 per cent. in the flange. The top corners are curved to a 5/16-in. radius, and the car wheels are designed to give on this as little friction as possible; as the rail more nearly wears to the shape of the flange the friction is augmented. The height of the rail is identical with the width of the flange, so if this dimension is measured the weight can be determined.

The table shows the weight of rail per yard corresponding to the height of flange width.

Weight	Width of Flange or Height, In.	Weight	Width of Flange or Height, In.
25	2¾	45	3½
30	3	50	3⅝
35	3¼	60	4¼

Laying Rail

In laying rails, the joints should be staggered; that is, the joints of one rail should as nearly as possible come opposite the center of the rail lengths in the opposite rail. Lengths less than 10 ft. should not be used.

In Fig. 1 are shown a number of defective joints exceedingly common in mine-track construction. No. 1 shows what is known as a "dish." This is usually caused by the traffic pounding down the joint. In No. 2, two objections will be noticed; first, the ends of the rail should be butted closer together, and second, the rails are on different levels. No. 3 shows two rails which are not in alignment, probably caused by not using joint fastenings. No. 4 is an example of improper curvature, or lack of curvature in bending and laying the rail. The joint should be just as symmetrical and easy running as the remainder of the curve.

When the cars travel over a joint such as No. 1, or a "high joint" (the contrary condition to No. 1, caused by the rail creeping or being improperly laid or ballasted), it necessarily forces one of the wheels to rise above the rail; the consequence is that quite often the flange mounts the rail and the car is thrown off the

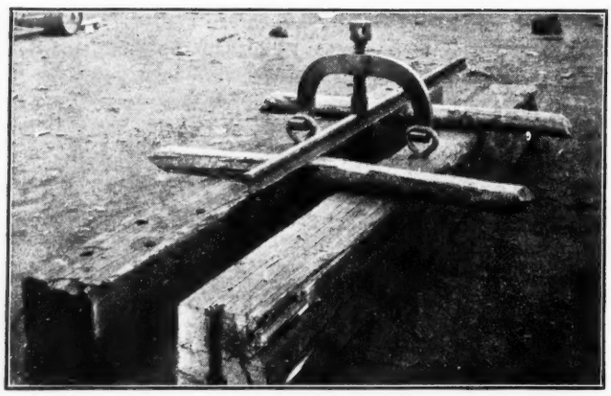


FIG. 2. SIMPLE DEVICE FOR BENDING OR DISHING RAILS

track, When the trackman seeks to remedy the condition, what often seems the natural thing to do is to elevate the rail which the car has mounted, when really the difficulty is frequently on the opposite rail.

The objection to a joint such as illustrated in No. 2 (Fig. 1) is apparent. While it may not cause a derailment, it sets the entire trip bumping and jogging, racks the rolling stock and loosens all the topping on the cars.

The objections to a joint such as is shown in No. 3 are not always as striking as on this figure. The track is apparently not true to gage at the end of one of the rails, and one end is probably loose. When no joint fastenings are employed the rail may spring laterally during the passage of a car and immediately thereafter revert to its natural position. The car, if going at some speed, may travel considerably beyond the defective point and its location go unnoticed.

No. 4 (Fig. 1) is the most usual form of bad track. The rail is not curved uniformly, and a swaying motion is imparted to the cars; if the velocity is sufficient, the flange may run directly over the rail.

To be sure, all derailments cannot be ascribed to the track, and in some instances they can be traced directly to the car. However, if the track is in perfect condition the car must be unusually bad before it will leave the track.

All rails should be laid true to the correct gage of the track except where allowance is made for curvature. The practice of slightly reducing the gage of the track to allow for the deficiencies of the gage of the car wheel is questionable, since this expedient impairs the wheel gage of any new cars.

Fig. 2 shows an ordinary rail bender, or "Jim Crow," adapted for bending heavy rails or "dishing" them. The contrivance consists of two eye-bolts, two old sticks of timber, two mine ties and a rail bender. The greater the spacing of the ties, the greater will be the power of the bender.

Rail which has previously been used for locomotive haulage will frequently be found to be brittle and break before bending. This condition is due to the crystallization of the steel from the constant impact of the wheels and does not, as is often erroneously believed, arise from the return passage of electric currents. The effect, if any, of the electricity would be to soften the metal. However, where the bonding of the rails is deficient, the electric current sometimes leaves the rail and runs through the soil, again returning to the rail. This leaving and reëntering the rail causes an electrolytic action, and the rail sometimes disintegrates at the points of exit and entry.

Where the rails have crystallized, or become brittle, they should be either annealed before bending or be bent while hot.

Where rails are laid underground, the small variation in the temperature will not require any allowance at the joints for expansion; when they are laid on the surface, however, the space left for the expansion of 30-ft. rails should be as follows:

Temperature When Rail Is Laid	Space To Be Allowed for Expansion
24 deg. and less	¼ in.
25 deg. to 49 deg.	5/16 in.
50 deg. to 74 deg.	⅜ in.
75 deg. to 94 deg.	7/16 in.
95 deg. and over	Nothing

On tracks on a heavy grade, or where the traffic is always in the same direction, the rail will have a tendency to "creep," or move forward. Where this occurs switch points should be inserted at sufficient intervals along which the rail can creep without distorting the alignment of the track.

Wooden Rail

In flat pitch mining, where the car is taken by gravity from the working face, with the wheels spragged to retard the velocity, wood rail is frequently used on account of its higher coefficient of friction, or resistance to sliding. This coefficient for cast iron on steel is 0.20, and for cast iron on oak 0.49, or about 2½ times as great for the wooden rail.

It is problematical whether the use of wood rail is warranted under any conditions. Many mines have discontinued its use without any noticeable inconvenience on their heavier pitching "slants," or chambers. This is accomplished by running a plank along the outside of a light tee rail. The tread of the wheel being wider than the head of the rail allows the wheel to slide upon both the plank and the tee rail.

Among the objections associated with the use of wooden rail are: Its short life; the action of the wheels rounds off the corners and wears splinters off the surface; it is usually received in a warped condition and the rails are often not uniform in cross-section. Owing to these conditions, and the ease with which the wheels mount wooden rails, the cars are much more subject to derailments than when steel rail is employed.

Wood rails are usually laid in a tie which has been notched to the proper gage. They are held in place by a round spike and can be laid about as rapidly as can steel rails.

The rail is usually ordered about 3 x 5 in. in section and in 12 to 16-ft. lengths of beech, birch, maple, oak or ash. Care should be taken to have such rails sound with square edges, and to have them stored in a manner to prevent warping.

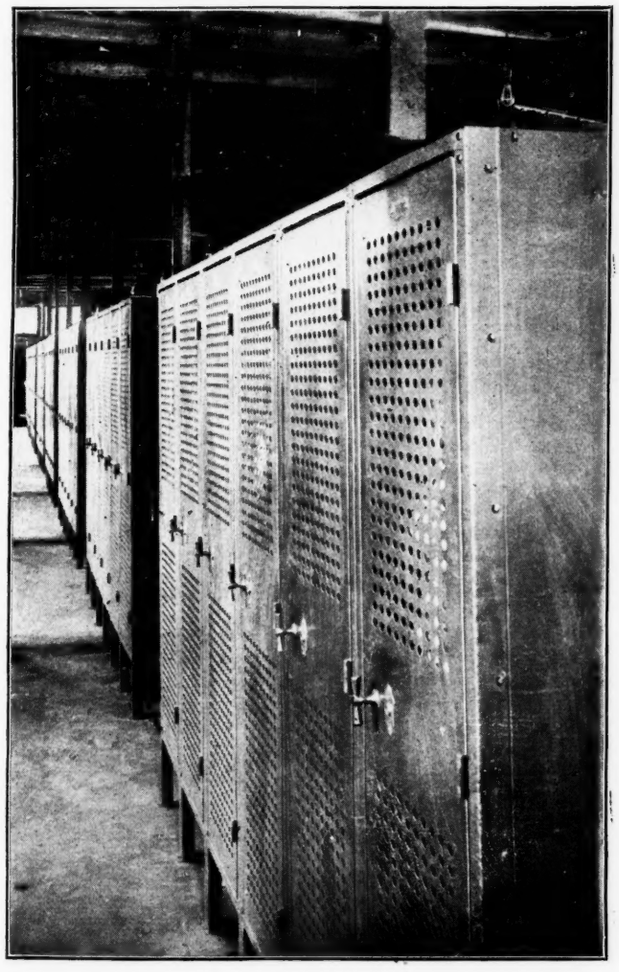
(To be continued)

Steel Lockers for Wash Houses

By Theodore Hiller

Canton, Ohio

The nation-wide propaganda carried on during the past few years to promote welfare work in manufacturing concerns has been so successful in producing the desired effect that the movement has branched out into practically every field of endeavor.



STEEL LOCKERS, KNOX MINING CO., ROCKWOOD, TENN.

In fact, among the investigations that the Bureau of Mines has been directed by law to undertake are those dealing with the health of miners and the improvement of sanitary conditions at mines. The law in many states already demands that the mining companies provide wash houses and lockers for mine employees. Those companies complying with this law, as well as companies where this law has not as yet gone into effect but which have voluntarily made such provisions, have found it of mutual advantage to both themselves and their miners.

Most workmen—and miners are no exception—like to go to and from their work dry and clean. A conveniently located wash house, equipped with steel lockers, will enable them to have a good "wash-up" at the close of a day's work; the well-ventilated lockers will keep their street clothes in a safe place—in good order—and their damp pit clothes over night.

This welfare work materially aids in keeping miners healthy and in a more contented frame of mind. When miners are accorded personal consideration—as they should be—they are not so apt to become dissatisfied and leave a company to accept employment elsewhere.

Steel lockers are strongly constructed of heavy-gage steel and will withstand the hardest usage without depreciation. They are sanitary, fire retardant and prevent the spreading of contagious disease. The perforated doors admit ample air circulation. The multiple-point locking device securely fastens the door, preventing petty theft.

A big feature of such lockers is their flexibility of arrangement, permitting an equipment to be taken down and rearranged to meet changing conditions.

Many mining concerns, while appreciating the advantages of steel lockers, may be under the impression that they are costly. Such is not the case—in fact, by proper arrangement they are reasonable in cost, especially in view of their long life of service.

New Box-Car Loader

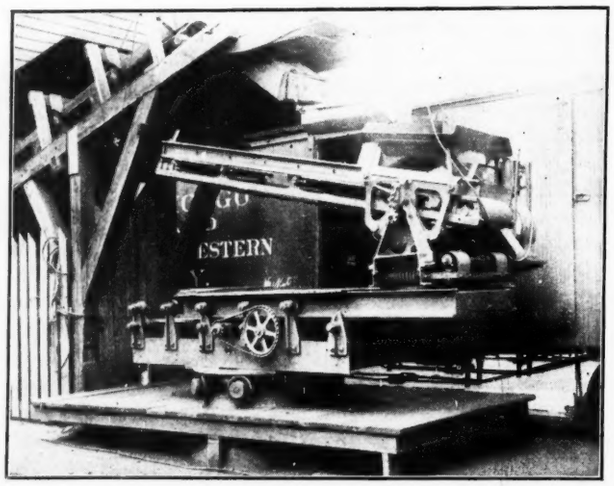
The Ottumwa Box-Car Loader Co., of Ottumwa, Iowa, has recently placed on the market a new belt-conveyor type of box-car loader. This machine has a number of distinctive features which will be found in no other belt loader, and the manufacturer claims that it is by far the best loader yet placed on the market for the use of those desiring a belt-conveyor type of machine.

Among the advantageous features claimed by the manufacturer for this machine are the following: It has a conveyor that moves back and forth, up and down, and from one side to the other, all of which movements are mechanically actuated. Owing to the extreme flexibility of this conveyor, which can carry coal to almost any point in the car, the throwing of coal is entirely eliminated, the coal being actually carried to the point at which it is to be loaded and deposited either on the floor of the car or upon the pile of coal which has already accumulated. By moving the conveyor up or down the coal can be laid almost directly on the floor, if so desired.

The loader is built in two models—stationary and portable—and utilizes either rubber or steel belt, depending on whether fine or lump coal is to be loaded. The conveyor of this loader is extremely long in order to carry the coal well back into the end of the car.

Every operation of this new loader is mechanical, and the machine can be moved by power in and out of the car or even up or down the track provided the machine is of the portable type. The loader fills both ends of the car without having to be removed or without even stopping the flow of coal. This also is claimed to be a decided time-saving feature and adds greatly to the capacity which this loader will handle.

The conveyor starts loading near the floor and near the center of the car. As the loading progresses the conveyor is gradually propelled forward into the end of the car and at the same time raised. During this operation it is also swung at will from side to side so that, as before stated, the coal is actually placed at any desired point in the car. The feature of being able to move the conveyor back and forth allows the placing



LOADER MOUNTED ON TURNTABLE TO OPERATE ON EITHER OF TWO TRACKS

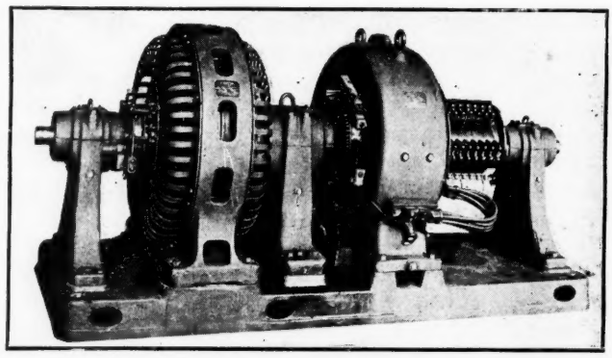
of the coal either near the center of the car or well out in the end and is an important consideration.

The conveyor of the machine may be placed squarely in the center of the car and receives coal from either side of the car as may be required at the particular mine at which it is installed. This feature also permits the distribution of the coal equally on either side of the conveyor. The belt, either steel or rubber, is reversible and runs in either direction. The operator for this loader stands entirely outside the car and is in no danger from flying pieces of coal, as he would be if he had to stand in the car. He is also removed from the objectionable dust and this makes his work more pleasant. This machine is already doing much needed conservational work in the anthracite field.

Electrical Equipment of a Small Mine

An interesting and very concrete example of the savings in man- and mule-power which can be made by installing electrically driven machinery in a small mine is furnished by the Smokeless Coal Co., of Johnstown, Penn. This mine, with an output of 450 tons per day, has electrified both its cutting and haulage equipment.

Coal is cut by three short-wall mining machines, and gathered and hauled by an electric locomotive. Power is purchased from the central station and passed through a 100-kw. motor-generator set designed especially for mining service and consisting of a 60-cycle, 2200-volt synchronous motor and a 275-volt direct-current generator. This set, together with the control apparatus, was furnished by the Westinghouse Electric

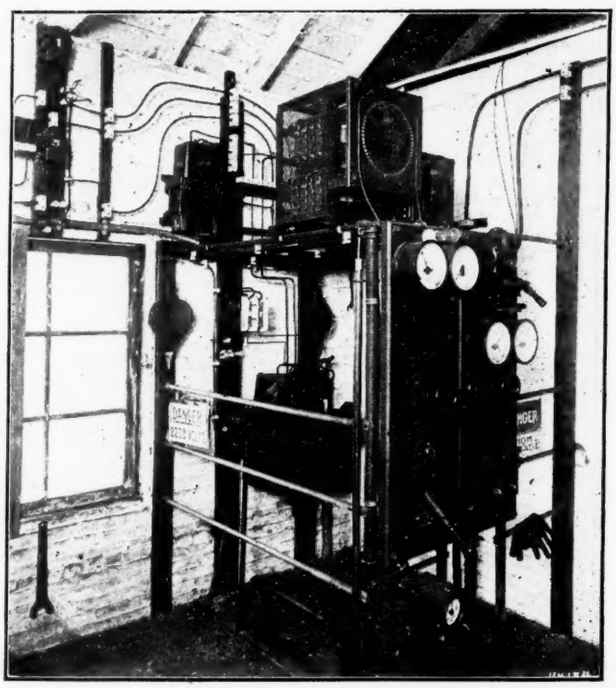


SYNCHRONOUS MOTOR-GENERATOR SET

and Manufacturing Co., of East Pittsburgh, Penn., and installed in a frame building near the head of the slope.

To start the set, the circuit-breaker handle which projects through the left-hand panel is thrown to the upper notch until the motor comes up to speed, and then is thrown down to the running position as shown. The direct-current voltage is then adjusted and the switch and circuit-breaker on the right-hand panel thrown in. After the field rheostat on the motor is once adjusted to give the power factor desired, it need never be changed, and hence the chain connecting the rheostat and handwheel can be removed, as the illustration shows.

Regarding the usefulness of its electrical equipment, officials of the mine say that a return to old conditions of pick mining and mule haulage would require twice the number of men and six mules. Not only from the standpoint of labor—now, as every operator knows, almost impossible to get—but also since machine mining is more efficient and cleanly, the company feels that its additional investment is paying handsome dividends.



SWITCHBOARD CONTROLLING MOTOR-GENERATOR SET

The Motor Generator in Mining

SYNOPSIS — *A greater number of motor-generators for converting high voltages have gone into use at mining plants in the past two years than in the entire previous history of the industry. This article gives a brief sketch of developments along this line.*

THE unusual demand for coal, which has been felt in this country for at least two years past, has had the effect of stimulating the producing end of mines already developed, as well as the opening of new or idle properties.

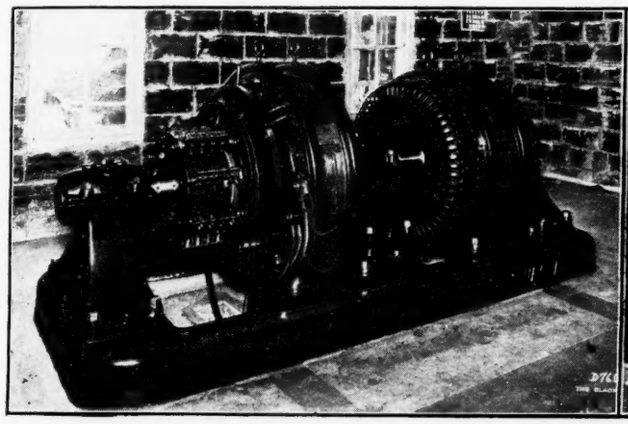
For the established producer, the problem has been to get out more tonnage; and the usual method of doing it would ordinarily be by employing more men. Owing to the labor shortage, which has likewise been keenly felt in all industries, many operators have been unable to more than hold the men they had when these conditions arose, and so the question has been, "How can I get out more coal with the men I have." To those who have opened new properties, the labor supply has been the first necessity, and either inexperienced hands had to be taken on or special inducements offered to miners already employed. This latter condition has further aggravated the case for the superintendents of operating properties. Along with this man problem there have, of course, been many other problems requiring solution, but the answers to most of them have probably been easier than the one of getting more coal with the same number of men.

Without question the use of electricity in the mining of coal has been the greatest step in advance which the industry has ever taken, and there are comparatively few mines opened or developed to any considerable extent in these days without its aid. Many of the older operations are equipped with individual power plants, consisting of boilers, engines and generators, with trolley and feeder distributing systems, coal-cutting machines and haulage motors. These plants are often comparatively small, and direct-current generators, wound for 275 volts in the majority of cases, but for as high as 600 volts in some instances, are used; and the construction of the entire system is of the most simple kind.

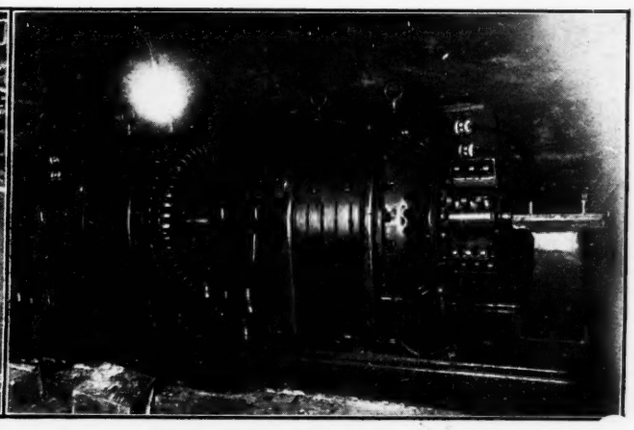
Where proper engineering skill has been employed in laying out such plants, both at the power house and underground, and care has been taken to keep the machinery in good operating condition, the overhead work well supported and insulated, and the tracks thoroughly and amply bonded, the results have been excellent as long as the distance to which current had to be carried was not beyond that at which it could be economically done with the copper installed and the voltage employed. From the day such a plant is put in service, however, its efficiency begins to go down, because the losses due to the transmission of current over steadily lengthening lines are increasing, and, in order to keep these transmission losses down, it is necessary to put up more copper and if necessary use return copper to help out the track system as a return circuit.

Of late years many operators of large bodies of coal have met this situation by building central power plants, located with reference to an ample water-supply for boiler-feed and condenser purposes, and installing alternating-current generators and high-efficiency prime movers. The alternating current is then transmitted at high voltage over the property and small substations located either on the surface or underground, as near to the working face as may be convenient. Here motor generators are installed and the high-voltage alternating current converted into direct current at the proper voltage for the cutting and haulage motors. In this way the heavy transmission losses are largely saved and the power cost brought to a minimum. The motor generator requires little space, inexpensive housing and foundations. It may, therefore, be readily moved as the mine develops, so as to keep the trolley-line losses down to a reasonable limit.

To the smaller operator, with power requirements which would not justify the investment in a new alternating-current plant, the public-service corporations have been offering power in many districts during the past few years, which has given this class of operator the opportunity to get his coal out as efficiently as the



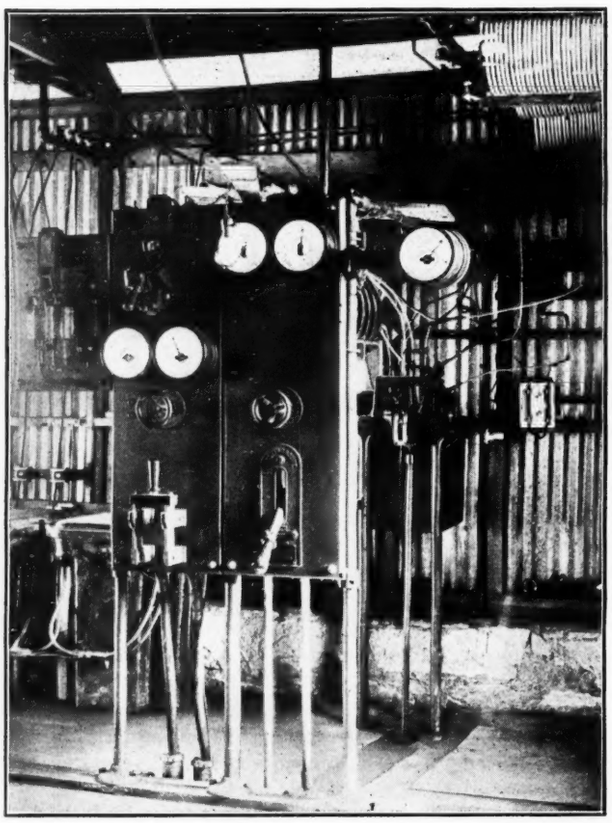
A 150-KW. MOTOR-GENERATOR SET INSTALLED FOR THE STILLWATER COAL MINING CO.



A MOTOR-GENERATOR SET INSTALLED IN AN UNDERGROUND SUBSTATION

largest producer. The operating conditions of small plants suffering from excessive transmission losses have also in many instances been greatly improved by buying power and installing one or more motor-generator sets located near the working face, their generators being connected to feed into the same trolley system with the steam-driven generator or into an entirely separate system, as conditions might determine.

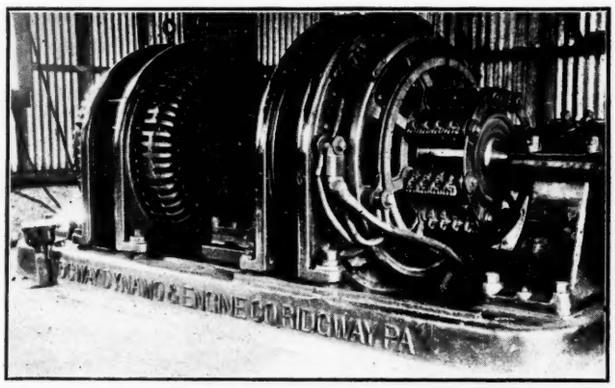
The motor generator as a converter of high-voltage alternating current into low-voltage direct current suitable for mine work has been a tremendous help in the unusual conditions which have confronted the coal-mining industry and which it will probably have to face for a year or more to come. In addition to its small cost, as compared to a complete power plant, its efficiency of operation, its ability to stand up to the work under most severe conditions and the ease with which it may be installed or moved, should be noted the fact that it requires very little attention. Being self-contained and usually provided with ample safety devices in the way of circuit breakers on the switchboard, there is nothing that requires attention except the occasional renewing of oil in the bearings and the resetting of the circuit breaker when opened by short-circuits or excessive overloads. Even this circuit-breaker trouble has recently been obviated by the development of a thoroughly safe



SWITCHBOARD CONTROLLING A MOTOR-GENERATOR SET

and effective automatic breaker which recloses the direct-current circuit after it has been opened and the proper conditions restored, but which will not reclose it after a short circuit until the "short" is removed. In many instances the motor generator is given practically no attention, except to start and stop it, and the labor cost chargeable to its operation is therefore at a minimum.

The selection of a motor generator of proper capacity is governed by the same general considerations which would apply in the case of an engine-driven generator, and these will, of course, vary somewhat according to



MOTOR-GENERATOR SET INSTALLED BY THE DANIEL BOONE COAL CO.

local conditions. It is wise to allow some margin of reserve capacity to take care of unforeseen demands for power and normal development of the mine, but the installation of additional sets from time to time, as more power is called for, is possible with minimum investment and small delay.

The motor generator is not a new and untried piece of apparatus, but on the contrary has been thoroughly tested and proved in actual everyday service and has been found to be dependable, efficient and eminently satisfactory under even adverse operating conditions. Many operators are at present laboring under a variety of handicaps, which make it difficult to show actual profits even at the high prices which coal is now commanding. Any method or equipment which will reduce fixed investment charges, overhead, operating and upkeep expense, while contributing at the same time to increase of output, will materially add to the profits.

If what has been said, in a very general way, of the motor generator as a tool ready to the hand of the coal operator is true, it offers a first aid to the solution of some of his most vexing problems just at this time. The fact that hundreds of these machines have been put into service in the mining fields in the past few years, and many more within the past two years than in all of the previous years together, would seem to prove the case beyond question and speaks volumes for the enterprise and readiness of the men in the business of mining coal to take advantage of more efficient methods as they are developed from time to time.

Closer Supervision at German Mines

In Germany there is a supervisor for every 15 or 20 men engaged in the coal mines. In this country if we have one pit boss for 150 men we consider that we have enough. We must have closer supervision to get better extraction results and reduced loss of life and limb—Francis S. Peabody, president Peabody Coal Co., before Chicago Section, American Institute of Mining Engineers.

Judge's Charge in West Virginia Operator's Case

SYNOPSIS—*The value of the evidence against the operators appeared largely to rest on whether the acts of the defendants were of so uniform a character as to show that they were based on an agreement. Though proof of the bunker agreement was ample and though prices of all other coal were admittedly discussed, the fixing of prices could only be proved by inference and even then need not have been in violation of the Sherman Act.*

THE following gives the gist of the charge of Judge William I. Grubb, of the United States District Court, to the jury that acquitted the West Virginia operators of a conspiracy to fix prices:

The section of the Sherman Anti-Trust law that the defendants were accused of violating was construed by the courts of last resort of the United States to mean not *any* restraint, but any *undue and unreasonable* restrain.

Now two general propositions have been stated by counsel to the jurors: (1) Have the defendants or some of them engaged in a combination to restrain trade? (2) If there was such a combination, was it of the character that the courts have said is alone amenable to this rule; namely, was it an unreasonable or an undue restraint of trade?

Before considering the first question, it may be pertinent to consider another: What is a combination? In plain terms it is a number of persons agreed to act in concert. Then will arise another question: How may combinations be established and their existence proved? It is possible that such combinations may be established by an express agreement between the parties to act concertedly. As an instance, the London agreement regarding bunker coal "where it is not disputed that the parties did act by an express agreement."

Combination Need Not Be Definitely Organized

Such a combination might exist in the form of an organization; that is, men might get together and organize themselves into an association or corporation with by-laws and a constitution and then act corporately and set forth these acts in minutes. The combination and its scope would be evidenced by the by-laws, constitution and proceedings as recorded in the minutes.

But the existence of a combination need not be so patent. It could be proved in another way. Thus a combination might be construed to exist among a body of men not so completely organized, and this combination might be proved not by any direct evidence as to what they agreed upon, whether the agreement was made in writing or orally, but by subsequent acts done in evident pursuance of the agreement such that no other interpretation could be put upon the acts other than that they were the product of an arrangement between the parties charged with having combined. In other words, the combination may be legally proved even though no proof at all is shown as to what transpired when the combination was formed.

To Prove Legal Combination Is Not To Convict

Having thus considered the question "What is a combination?" we come to the larger proposition, "What is a combination to restrain trade?" The Government, as I see it, seeks to indict these defendants or some of them solely for fixing terms and minimum prices for contract coal.

Evidence has been offered under that averment to show that uniform action was planned with reference to terms other than prices such, for instance, as the standardization of contracts. Evidence was offered also that at some of the meetings an attempt was made to provide a uniform standard for the screening of coal and a uniform date for transferring. The calendar year was to replace the 1st of April for that purpose. Then it was shown that a differential was to be provided when special equipment was demanded by the purchaser.

All these provisions singly or together, if not accompanied by any agreement to fix prices, would not seem to constitute an unreasonable restraint of trade; but on the contrary they would seem in themselves to be rather advantageous to both operators and purchasers. But it might appear to the jury that they were enacted for the purpose of making a combination to fix prices, if one existed, more easily enforcible. In that light the jury has a right to consider testimony regarding them.

But so far as they form ground for conviction for an unreasonable restraint of trade, I charge you to the contrary. The Government must prove a combination on the part of the defendants or some of them to fix minimum prices on contract coal. You will recall that the indictment has no reference to spot coal, but to contract coal only.

The question then arises how, if at all, could minimum prices be established? There is an organization known as the Association of Smokeless Coal Operators which the Government does not try to prove on its face the instrument for this restraint of trade. Its by-laws, constitution and minutes show it to be an organization for other purposes than the fixing of prices.

Can't Be Convicted by Reason of Membership

The mere existence of such an organization is no evidence of a combination to fix prices in face of the fact that the proceedings are silent as to any authority or purpose to make such provisions. Then, again, there are defendants named in the indictment who were not members of the Smokeless Operators' Association.

Some of the bunker suppliers and their selling agents were not members, yet they are included in the indictment as members of what the Government charges was an illegal combination. Then, on the other hand, there are possibly some members of the Smokeless Coal Operators' Association who are not parties to the indictment. If the inherent purpose of the association was not to fix prices, mere membership in it would not make a member a party to any "combination to fix prices."

The agreement regarding bunker coal may or may not be a part of the larger agreement that is alleged. That agreement was signed, and there is no question that it was entered into by the persons signing it. But as to the other part of the combination alleged there is more uncertainty. Mere membership in the Smokeless Operators' Association would not prove anything, for the persons indicted and the personnel of the association are not identical and coextensive. So the proof will have to come from what has been done by the defendants.

Defendants Admit They Discussed Prices

The Government's theory, as I understand it, is that the combination exclusive of the bunker feature of it is to be inferred from the fact that the defendants or many of them attended certain meetings at which prices were discussed. Or if they did not attend these meetings they were furnished a circular of prices immediately after the meetings and were thus apprised of what had been done at those sessions. It is declared that they—not merely one of them but many of their number—acted on the prices in those circulars. Their uniform action is said to admit of no other hypothesis than that they acted concertedly or by reason of the fact that prices had been agreed upon at such meeting or meetings. On this theory the Government asks you to infer that the defendants did these acts because they had put themselves under an obligation to do them.

The defendants say, however, that there was no price fixing at any of the meetings, that there was mere discussion as to what the prices ought to be and a mutual disclosure as to what the different speakers expected to make their prices. They declare that there was no one put under an obligation to maintain prices as a result of the activities of the association or of the alleged combination. There were no penalties or other means of enforcing compliance.

Having thus considered the existence of a combination, consideration may be given to the question whether it was an unreasonable and undue restraint of trade.

I think that if the combination was such a restraint of trade then the bunker agreement was a violation of the Sherman Act. It is true the agreement betwen the agents of the bunker suppliers was signed in London and that the contracts for the sale of coal under and pursuant of that agent's contract were made with the shipper in London.

But the combination that fixed the price acted in this country, and the coal was transported from the mines *in this country* to the bunkers of the foreign shipowners also *in this country*—namely, at Hampton Roads. The combination which fixed this price was in this country and the

delivery was made here, and consequently I charge you that this combination, if in unreasonable and undue restraint of trade, was a violation of the Sherman law.

It is necessary to inquire whether the indictment under which this prosecution is being conducted includes the bunker agreement. Every defendant, of course, when he goes on trial is entitled to have the whole charge formulated against him. He cannot be any more legally tried and convicted on a charge not formulated than he can on one of which he is not guilty. So the question whether the bunker agreement is within the charge made in the indictment is an important one.

WERE THERE TWO COMBINATIONS OR ONE ONLY?

If you believe that there was but one combination and that the bunker-coal combination was included in it, then you could include all the defendants in that transaction as if they all supplied bunker coal. But if, on the other hand, you believe there were two separate combinations—one fixing the price of bunker coal only and including only those who supplied bunker coal and sold it, and the other embracing all those who produced other kinds of coal—then, of course, you could not convict on both offenses, the Government having elected to proceed against the second combination. Viewing the matter from this light you could not regard the bunker-coal combination as an evidence of guilt of any of the defendants.

In determining whether the combination was reasonable or not you have a right to consider the condition of the coal trade in the smokeless-coal fields. If ruinous competition and improper trade practices "were injuriously affecting the proper conduct of the trade," then that would be a situation which might call for the making of an agreement between the parties to correct that situation. But it might not "be done at the expense of the public" or to such an extent as to restrict or destroy trade.

You have further the right to consider whether in the fixing of prices there was any purpose to establish boycotts or like interferences with trade. As I see it, there was no evidence of that kind. Apparently no competitors were threatened. There is an absence of evidence to show anything but an agreement among the operators to maintain a uniform minimum of prices.

You may also bear in mind that the amount of fuel mined by the defendants on trial, called smokeless coal, was about 20,000,000 tons per annum, and that from the evidence it appears that about 35,000,000 tons of that class of coal annually enters the market. You are at liberty to consider whether a fixing of the price of such a proportion of the tonnage would constitute an unreasonable restraint of trade.

Terry Turbines at Coal Mines

Terry turbines are built in sizes ranging from 5 to 1000 hp. They are designed to operate at high pressure either noncondensing or condensing, to furnish power from exhaust steam or to operate condensing and at the same time furnish exhaust steam for heating.

The type of turbine to be used depends upon the service required and the steam conditions. The turbine shown in Fig. 1 is used noncondensing for driving generators, pumps or blowers and the like. The action of the steam is different from that of the usual turbine, the steam striking the rim instead of the side of the wheel. Fig. 2 shows this action. The steam expands in the nozzle from approximately boiler pressure to the exhaust pressure. Issuing from the nozzle, at high velocity, it strikes the side of the bucket, in which its direction is reversed 180 deg. As this initial impact absorbs only a part of the total energy, the jet of steam passes into a reversing chamber which turns it back upon the wheel a second time. This action is repeated several times until all the energy is absorbed from the steam.

This principle of operation makes for higher efficiency at low speed, because more reversals can thus be had and accordingly more energy abstracted from the steam than in the type of turbine which causes the steam to strike the wheel at the side. With this efficiency there is further obtained simplicity and a practically trouble-proof wheel.

The wheel is cut from solid steel and the buckets are milled in the rim. There is thus no possibility of buckets coming loose. The power-producing action of the steam takes effect only on the curved surface at the back of the bucket. As the only function of the blades

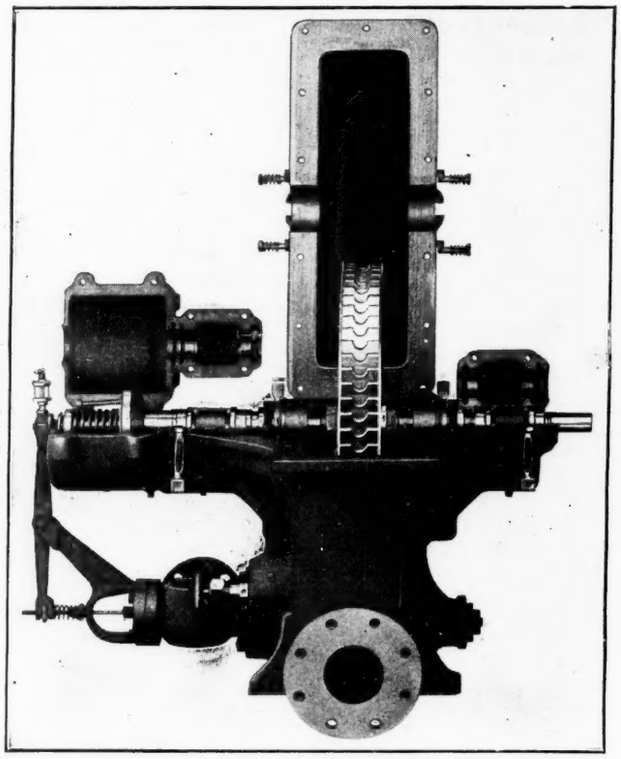


FIG. 1. NONCONDENSING TURBINE WITH TOP HALF OF CASING LIFTED

is to split the steam jet, close blade clearances between the reversing chamber and buckets are avoided. Clearances at the side of the wheel are larger in every case, being more than 1½ inches.

The advantages gained by the Terry principle have been continued in the design of the turbine casing and parts other than the wheel. In order to obtain ease of access to the interior for inspection or repairs, the casing is split horizontally. The steam inlet and exhaust connections are on the lower half, so that the upper half can be removed without disturbing them or the alignment of the unit.

This same principle is maintained in the design of the bearings and bearing covers, the bearings being split and arranged so that the lower half can be rotated and removed and a new one put in without disturbing the shaft. The oil wells are large, permitting ample radiation. In the case of slow-speed turbines, the oil is supplied to bearings by oil rings, while with high-speed machines oil is supplied under pressure from a pump driven either from the turbine shaft or from the reduction-gear shaft in case such a gear is used. Oil rings are used in addition to insure lubrication should the forced feed supply be stopped.

The governor is of the flyball type, and is mounted directly on the turbine shaft. It controls the admission

of steam by means of a balanced valve. Admission to each individual nozzle is in addition governed by a hand valve. This control permits obtaining practically full-load economy at partial loading. It further makes possible the purchase of a turbine to meet both present and future requirements with good efficiency under both conditions.

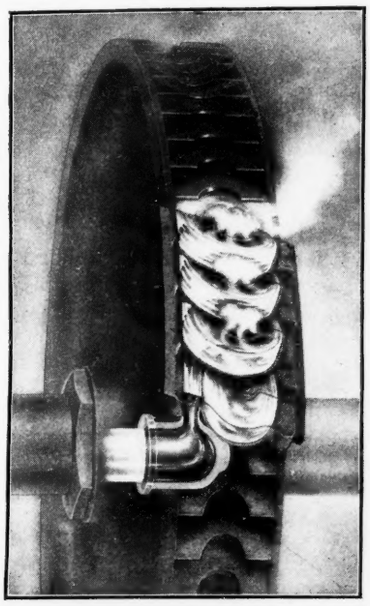


FIG. 2. ACTION OF THE STEAM ON THE TURBINE WHEEL

The condensing Terry turbine shown in Fig. 4 is really a combination of a high-pressure non-condensing and a low-pressure condensing machine in the same casing. It is this feature which gives it the name of "composite design." The wheels in this case are of the side-entry type. The clearances are liberal, however, in order to insure maximum reliability.

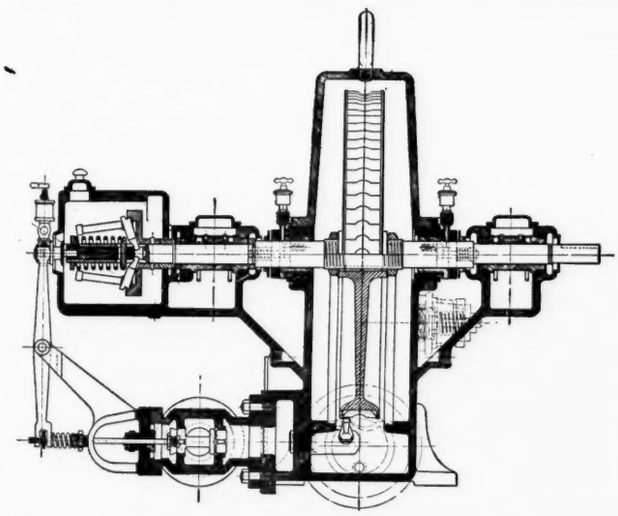


FIG. 3. CROSS-SECTION THROUGH CENTER OF TURBINE

In the condensing turbine not only the casing, bearings and housings but even the interstage diaphragms are horizontally split. The last feature gives a truly split-case machine. As in the noncondensing turbine the nozzles can be changed for varying steam conditions, so in the condensing turbine the diaphragms can be changed for differences in vacua. This change can be made without disturbing the wheels or the alignment of the unit.

In the smaller capacities governing is obtained through levers actuated by a flyball governor on the end of the main shaft. In the larger turbines the governor valve is moved by means of an oil relay actuated by the flyball governor.

In addition to a speed-control governor, the turbine is equipped with two emergency governors. One is arranged to close a butterfly valve in the high-pressure inlet line. The other is arranged to open an air valve, permitting an inrush of air to destroy the vacuum.

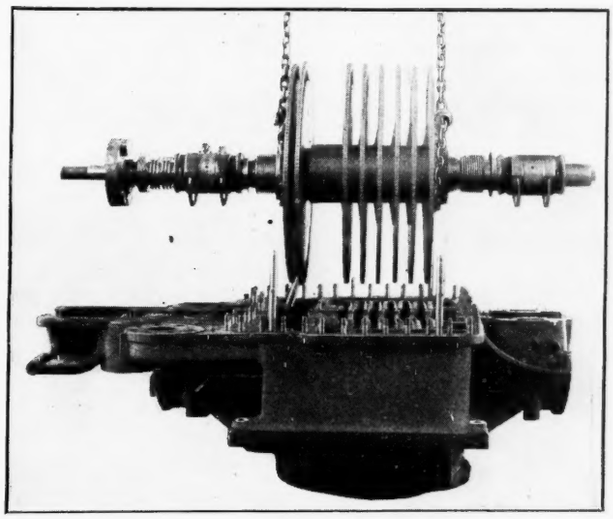


FIG. 4. COMPOSITE DESIGN WITH ROTOR LIFTED OUT OF CASING

The "composite design" turbine is also used for low-pressure and mixed-pressure operation, the only difference being in the governor control. The control of the low-pressure turbine is the same as that of the high-pressure except that an oil relay is always used.

As will be noticed from the foregoing, the Terry turbine has been designed for service under difficult conditions and with unskilled help. The split case, split bearings, steam and exhaust connections on the lower half, etc., are used on all sizes regardless of the service and despite the temptation to lower the first cost by the omission of those features.

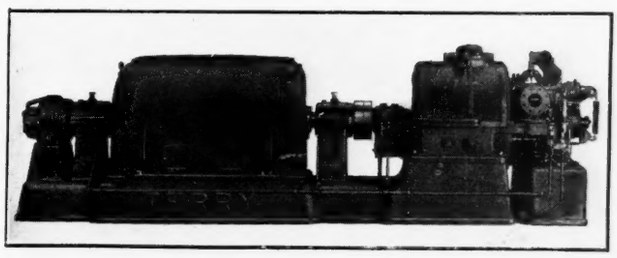


FIG. 5. A TURBINE DIRECT-CONNECTED TO A GENERATOR

These turbines have been used by various coal companies since 1908, and the wisdom of the design is shown in the fact that the first turbines purchased are still operating.

Rebuilding a Tipple

By MINER RAYMOND
Tiffin, Ohio

SYNOPSIS — *Reconstructing an antiquated plant is frequently more difficult than making an entirely new construction. In the case here described a complete new steel tipple was built on the exact center line of the old wooden structure and placed in operation with one shutdown of 45 min. duration.*

IN CONSIDERING the modernizing of an out-of-date plant, the question arises as to whether it is better to attempt a remodeling process, retaining as much as possible of the old in the installation of the new, or to build anew from the ground up and abandon the old entirely. Following the former process means that the result will be at best a patchwork job entailing serious interference with operation if not a complete shutdown while the remodeling takes place. The latter means a change in site when the new plant is completed, and it is often the case that the first locality is the best available and possesses advantages that the second cannot have.

In working out this somewhat intricate problem for the antiquated tipple at Mine No. 3 of the Raleigh Coal and Coke Co. at Raleigh, W. Va., orders were issued that at no stage of the work was the mine to be closed down. This rather remarkable feat of building a new steel tipple 15 ft. wide and 52 ft. high exactly on the center line of the old 20 x 56-ft. wooden tipple was

FIGS. 1 TO 12. VARIOUS STAGES IN THE WORK OF RECONSTRUCTION

performed with a shutdown of only 45 min. and that took place when a box-car loader was connected to the motor driving the rest of the tipple equipment. Except during that three-quarters of an hour it was possible at all times to load two or more grades of coal. The new tipple was erected piece by piece as the old structure was cut away.

In addition to the tipple a new dumphouse was built 150 ft. behind and 125 ft. above the tipple, and a retarding conveyor installed between the two, with some changes in the chutes and stationary screens in the old tipple. This work on the hillside was performed before the transformation of the tipple was attempted and included the grading of a gap 100 ft. long and 25 ft. deep between the old and new dumphouses.

When all this was ready, the old dumphouse was razed, new tracks laid from the mine mouth to the new headhouse and the dump mechanism with scales transferred to the new position. This work was begun one Friday night and the first coal run down the retarding conveyor the following Tuesday morning, with no further cessation of operation during the building of the new tipple than that noted above.

Fig. 2 shows the old tipple after the roof and siding had been removed and the retarding conveyor installed, while Fig. 14 is a view of the old screens during the change of tipple construction. As a contrast to these are Figs. 3 and 10, in which corresponding views of the new job appear.

The tipple spans four tracks with a cantilever extension 22 ft. long over the passing track. The inner, or No. 1, track is used for loading smithing coal in box-cars by means of mechanical loaders or direct into gondolas, while the other three tracks are served by loading booms which deliver run-of-mine, egg and lump respectively. Combined with the box-car loader and booms, a system of veils and chutes in the tipple make it possible to load 11 kinds of coal, each carefully prepared, so that the equipment as installed can hardly be characterized as incomplete.

The coal here handled is from the Beckley seam and is especially friable, so that in designing the new equipment special care had to be taken to avoid undue breakage and provide a clean, prepared coal. A large proportion of the mined product is used for smithing and has proved to be a high-grade fuel for this purpose.

Electric haulage locomotives deliver the coal to the dumphouse in two-ton mine cars in trips of 30. The coal is first weighed in the mine cars, then discharged by a crossover dump, the empty cars passing over this machine by gravity into the empty car pockets, where they are collected into trips and returned to the mine. The hopper beneath the dump holds three tons, a small capacity being adopted to eliminate the possibility of a long run by gravity, which means undue breakage of coal. An adjustable reciprocating plate feeder, as shown in Fig. 4, regulates the flow of the coal into the retarding scraper conveyor, both scraper and feeder being driven by a 20-hp. motor located on the tipple floor.

The retarding conveyor is 225 ft. long and consists of flights 36 in. wide by 15 in. high attached to roller chains, operating in a steel trough. It has a capacity of 500 tons per hour at a speed of 110 ft. per min. The conveyor housing is made up of steel angles bolted into cast-iron bedplates which are anchor-bolted onto concrete piers located 10 ft. apart on centers. In the construction of the entire conveyor line wood was only used on the roof.

It will be noticed in Figs. 6 and 13 that the conveyor is horizontal where the feeder discharges. It then passes through a vertical curve with a 25-ft. radius to a pitch of 31 deg. downhill into another vertical curve with a 40-ft. radius which terminates in the horizontal section, where the conveyor trough has a 15-ft. section provided with 1-in. round perforations. These holes permit the smithing coal to fall through into the two small hoppers seen at the left in Fig. 7 and on the right in Fig. 8. These collect the smithing coal and conduct it to the large hopper seen on the extreme left of Fig. 12. The hoppers are provided with valves which can be closed, causing the whole of the coal to be conveyed to the run-of-mine valve or onto the shaker screens.

When the run-of-mine valve is open the coal is discharged into the run-of-mine chute, which is provided with round perforations, as shown in Fig. 8. The run-of-mine chute perforations can be covered with veils, which provide a means of conducting all the coal, as it comes from the mine, to the run-of-mine loading boom. This boom is made up of 48-in. double beaded steel pans ¼ in. thick attached to roller chains. This boom, like its companions, has a 35-ft. hinged section that is raised and lowered by a standard 3000-lb. hoist located in the tipple.

The motive power used in the tipple consists of two motors, one driving the three loading booms and their

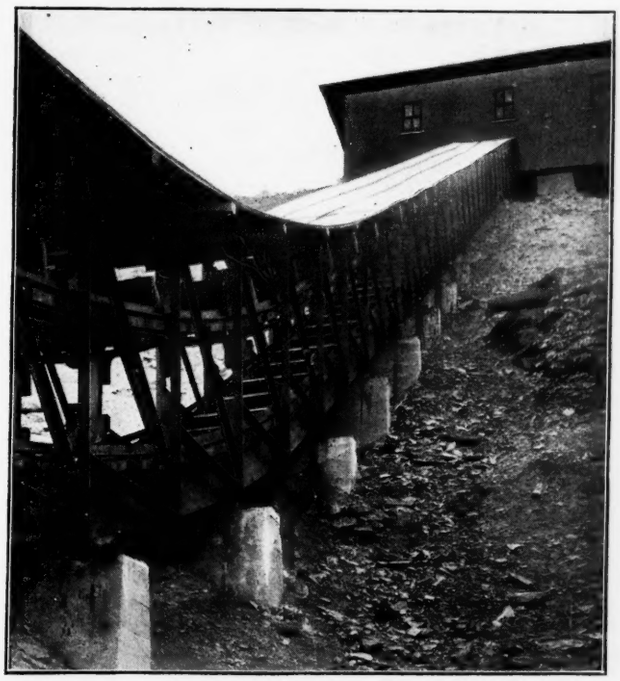


FIG. 13. THE INCLINED RETARDING CONVEYOR

hoists and the other operating the shaking screens and the scraper conveyor, seen in Figs. 7 and 8, which carries house coal over the cantilever section to the bin beyond.

The coal is fed regularly onto the shakers through the specially designed delivery end of the conveyor. This secures a regular distribution on the screens, as

shown in Figs. 9 and 10. The shaking screens are well balanced and create little vibration when they oscillate at the rate of 100 strokes per minute. They are hung from the roof chords by adjustable take-up rods.

The upper shaking screen has a 5-ft. section of ¾-in. round perforations to take out the smithing coal. This

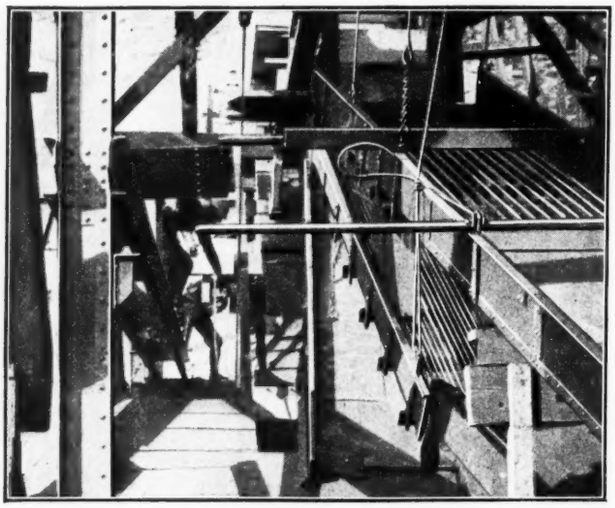


FIG. 14. THE BAR SCREENS

is conducted to the bin shown at the extreme left in Fig. 12. The remaining coal then passes onto a lip screen, which is 12 ft. long and 6 ft. wide and permits all coal 2 in. in size or smaller to be deposited onto a 1-in. lip screen below. The fine coal that goes through the 1-in. lip screen is carried to the bottom flight of the drag conveyor, thence to track No. 2. The nut coal is conveyed by the top flight of the drag conveyor to the house-coal bin, or to track No. 3 or track No. 2. The coal that passes over the 2-in. lip screen in the upper shaker is discharged into the lower shaking screen and over a 6 x 10-ft. section of 3½-in. lip screen. The coal that passes through this screen is diverted onto the rescreening egg boom, thence to track No. 3, or it can be bypassed to the top flight of the drag conveyor and so to the house-coal bin, track No. 3 or track No. 2.

The remaining coal on the lower shaking screen is passed onto the lump-coal rescreening loading booms, shown in Fig. 11. These are a distinct innovation in that they depart from the usual construction by using malleable-iron grates instead of the standard solid steel pan or apron. Great care is taken through the entire preparation process up to this point to screen out all fines, and continuing this precaution, the fines that drop through the grates in these booms are carried back up to the drag conveyor by the return run of the boom. All three loading booms are arranged so as to be able to load the largest or smallest hopper cars on the road and work with perfect freedom.

The entire equipment is under the control of the operator in the tower seen at the right of Fig. 12, where oil switches govern the motors which drive the screens, conveyors and booms.

The tipple was designed and built by the Webster Manufacturing Co. under the supervision of Wade H. Horn, chief engineer and assistant to Ernest Chilson, the general manager of the Raleigh Coal and Coke Co. Mr. Chilson commissioned Mr. Horn to produce an entirely new plant without cessation in the loading of coal. The work above the tipple was entirely Mr. Horn's, the Webster Manufacturing Co. furnishing the machinery for the retarding conveyor and feeder.

Automatic Safety Mine-Car Cager

BY N. L. HARMON

Among the many labor-saving machines which are attracting the attention of coal operators is an automatic safety mine-car cager. The accompanying sketches show the plan of the cager. It is built on 14- or 16-ft. rails and all parts are beneath the surface, with the exception of the horns on the outside of the rail. These are provided with buffer springs to absorb the shock and prevent damage to wheels, axles and cars. The cager is located at the shaft bottom directly in front of the sump. The operation depends upon gravity and the action of the cage. As the cage descends, it depresses the lever attached to the rocker shaft, which causes the shaft to rotate, thus opening the forward pair of horns and closing the rear pair, at the same time raising the weight. Thus with a trip of cars standing against the forward horns of the cager, the cage as it lands at

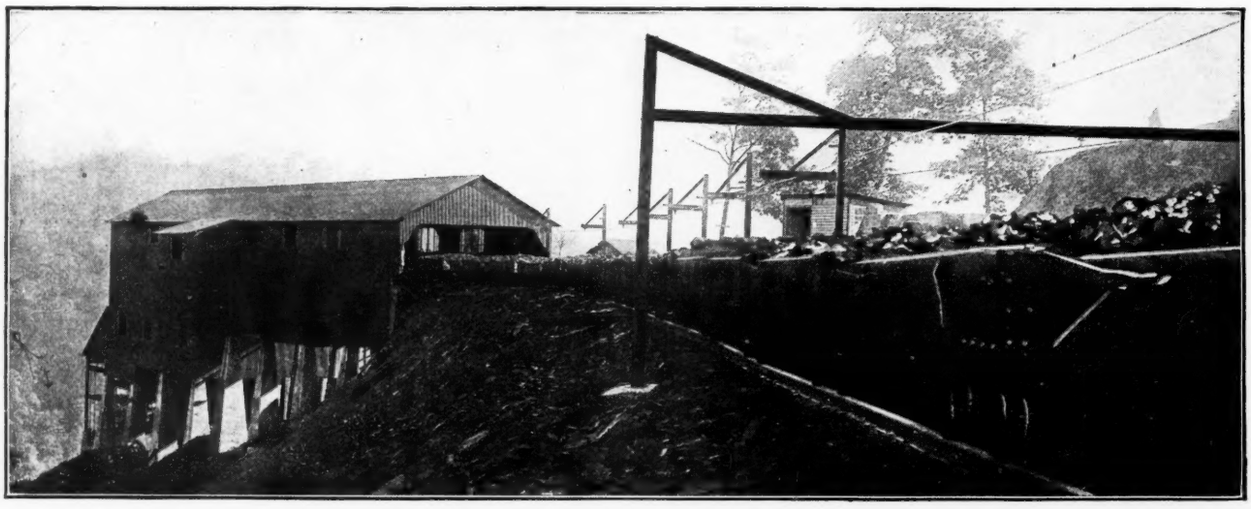


FIG. 1. CLINCHFIELD COAL CORPORATION'S DANTE TIPPLE, WHERE THE TRIPS ARE KEPT CLOSE UP TO THE DUMP POINT AND READY FOR DUMPING AT ALL TIMES

the bottom opens the front horns and closes the rear horns, holding the trip in check and permitting the front car to pass onto the cage, where the automatic stop spots and holds the car in position.

As the cage rises, its weight is taken off the lever, and the weight no longer supported, falls, closing the front horns and opening the rear horns, permitting the whole trip to advance one car length.

Three different styles of automatic stops are employed, so that it is possible to adapt them to any type of cage. They are independent of the cager but form an important part of the working system and with the cager form a complete machine. In one style of stop, the landing of the cage opens the blocks on the cage, releasing the empty car. The loaded car entering the cage displaces the empty car, which thereby places the automatic stop in the correct position to take proper care of the loaded car.

The machines enable the cars to be caged with great rapidity, thus increasing the output. The Superior Coal Co., of Gillespie, Ill., hoisted 5502 tons in 8 hours, using 1556 mine cars, thus securing the state record. The American Coal Mining Co., of Bicknell, Ind., hoisted 5048 tons in 8 hours. In May of this year the latter company's average daily record was 4595 tons. It hoisted as many as 18 cars in 5 min., lifting them 564 ft. Both companies give the credit for their speedy operations and large tonnage to the automatic cagers.

These machines reduce operating expenses by requiring fewer men at the landing, prevent expensive delays caused by cars getting into the sump and keep men away from the shaft and so protect them from the dangers attendant on the falling of coal.

The grade required is about 4 per cent. for the length of the machine and, beyond that, just enough so that the cars will move by their own weight. The surface bend in the rails, Fig. 2, is a clever feature, providing the required grade where needed. The front wheels stand just over the knuckle, insuring the instant and rapid travel of the car as soon as it is released.

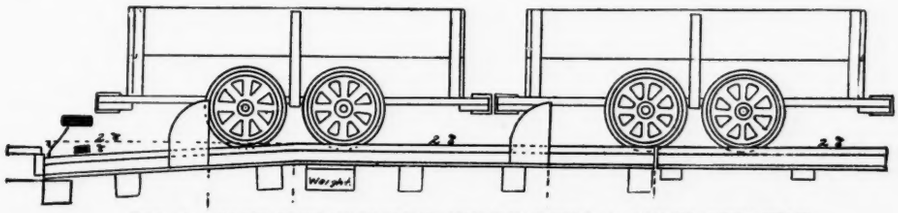


FIG. 2. NOTE THE KNUCKLE WHICH GIVES A QUICK GETAWAY

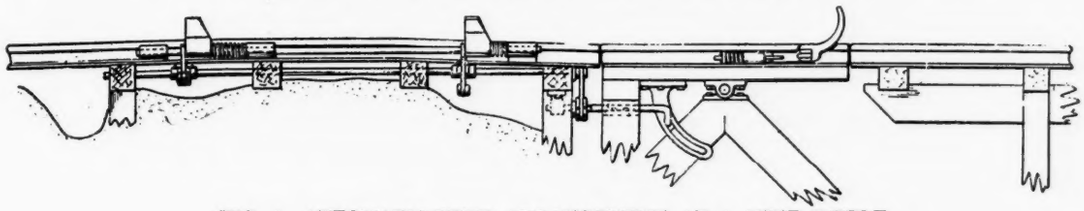


FIG. 3. AUTOMATIC-FEED ARRANGEMENT AT A MINE TIPPLE

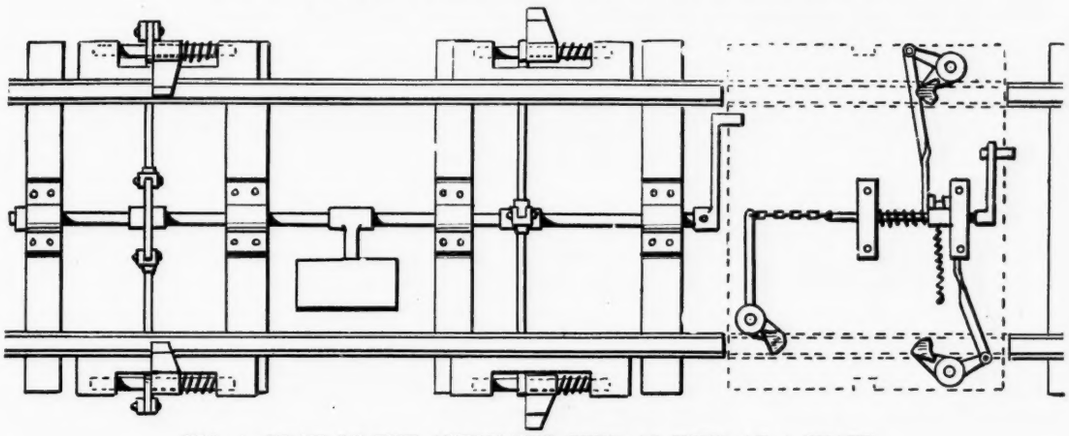


FIG. 4. PLAN OF THE AUTOMATIC FEED AS USED AT A SHAFT

The machines can be installed and used with success in any shaft mine where the grade is about as stated. They are made in three different weights to suit the requirements of different mines.

The automatic mine-car feeders, Fig. 3, are used with equal advantage at tipples. The feeder is here actuated by the dump. It may be installed either in front of the scales or between the scales and the dump. In case a crossover dump is not used, the feeder may be actuated by a hand lever, which is always under the control of the dumper.

The Clinchfield Coal Corporation, of Dante, Va., is handling at the present time an enormous trip of heavy cars back of the feeder.

The time required to install an automatic cager is short and need not interfere with the operation of the mine for any length of time. Many have been installed where the mine was idle but one working day. The Mining Safety Device Co., of Bowerstown, Ohio, manufactures these automatic cagers and feeders.

Reducing Costs of Coal Loading

It has been estimated that five men are needed at home to support one soldier at the front. If 1,500,000 have to leave America for France, there will be 7,500,000 men working to keep the fighting line equipped and supplied, and the working force will therefore be deprived of 9,000,000 workers. The shortage of labor will be one of the greatest difficulties we shall have to confront. It can only be met by the use of machinery.

There is perhaps no work around coal mines which is better suited to exhibit the efficiency of machinery than the loading of coal into box-cars. The machine quadruples the work done by the men employed, and this not only saves time but permits of a larger output. It makes the filling of box-cars feasible even where a large tonnage is required.

It being hard in many cases to obtain gondolas and hopper cars, the man who can fill box-cars—and get his clients to accept them—is at an advantage. The Western trade having more return cargoes for box-cars than for open cars, demands the use of the latter; and that operator is fortunate who is equipped to load them. The box-car loader with two men will load a car in 10 min., whereas six men will be pushed to load a car by hand in 45 minutes.

The mechanical loader also makes it possible to diminish the breakage that results when coal is loaded by hand, for the modern loader does not cast the coal into the car as the human loader does, but gently conveys it to the point required and then drops it from a height which can be regulated to suit the dumping needs.

The Manierre type of loader is merely a conveyor supported on two arms which are hinged from a post that is planted near the loading track or between two tracks or in a car running on a track of its own. When placed between two tracks the loader can be used to load coal into cars set on either track.

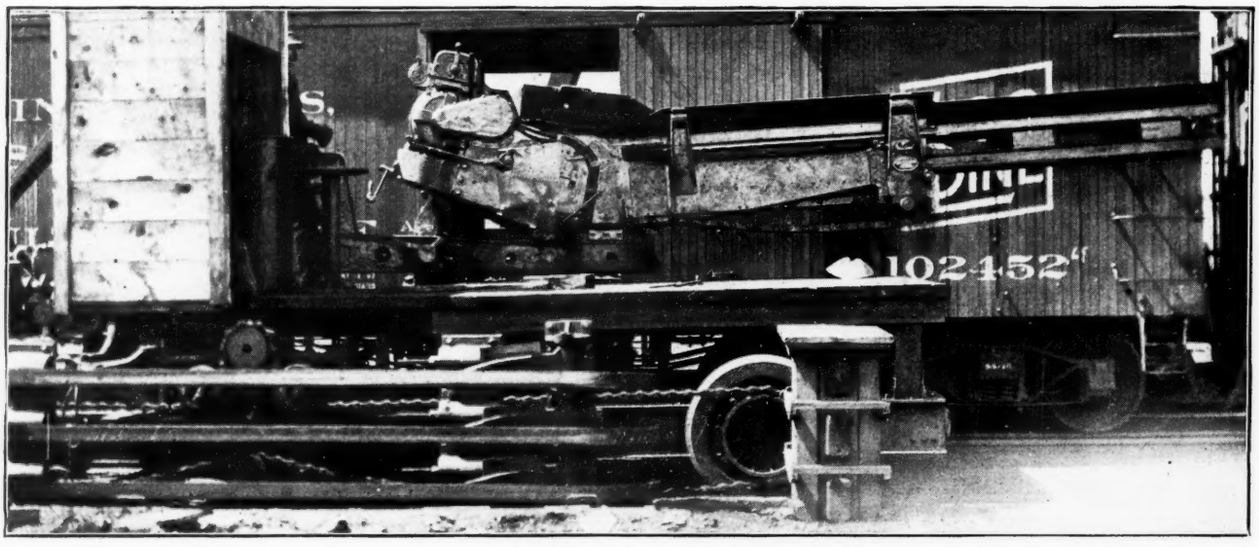
The coal chute is usually placed on the same side of the car as the loader, but that is not necessary It is flexibly attached to the loader and consequently follows it in all positions. A deflector at the receiving end of the loader turns the coal as it comes from the chute in the direction of the belt, reducing the breakage of the coal and increasing the life and capacity of the conveyor.

In the loading of coke, the material to be delivered cannot be run by gravity into the car so far as can the coal from a tipple, for the coke is not delivered to the loader at so high a level. For this purpose the loader is partly withdrawn and the chute placed on the side of the machine so that the coke is filled into the center of the car.

In order to reduce breakage the conveyor can be readily tilted toward the floor by turning a crank at the rear end of the machine. Even the level of the loader itself can be regulated to suit the needs of the varying railroad equipment. For this purpose a jack is mounted on the loader post. This can be easily operated by one man.

The loaders are made with 16- or 24-in. belt conveyors or with a 24-in. steel-apron conveyor where large lump coal is to be delivered. The 16-in. belt machine will load 4 tons of coal per minute; the 24-in. belt has a capacity of 6 tons, while the 24-in. steel-apron loader can take care of 8 tons. But these capacities are for continuous work, and deductions have to be made for the two minutes which are lost in getting the loader in and out of the car, and in detaching the chutes and changing the conveyor from one end of the car to the other. To make matters clear: The actual time required to load a car is the time the coal is running plus two minutes.

The chute is designed to suit the special requirements of the loader. It consists of two sections, the upper one pivoted vertically and the lower one horizontally, so as to allow a universal motion of the spout. The lower section, or spout, travels on the track suspended from the upper section and is counterbalanced so as to require little effort in attaching and detaching from the loader. The in-and-out motion is accomplished by means of a chain wheel. The fixed chute to which the loader chutes are attached terminates 11 ft. 8½ in. above the top of the railroad rail and 8 ft. 2½ in. from the center of the track. The type of loader just described is built by the Manierre Engineering and Machinery Co., of Milwaukee, Wisconsin.



BOX-CAR LOADER QUADRUPLES LABOR EFFORT, IMPROVES PRODUCT AND INCREASES PLANT OUTPUT

The Labor Situation

General Labor Review

There is more or less trouble everywhere in nonunion districts. The labor-union men are busy trying to mend their fences. They feel there is no time like the present to do this work. Probably they are right. The work of making trouble seems quite easy, for the foreigners seem readily induced to strike and make trouble when approached by agitators who come from their own country and speak their own language.

The union leaders recently complained bitterly that labor was not represented on the Committee of Coal Production and that the union's provisions and promises for increasing production were ignored. So the leaders were put on the committee. What did they do? Did they try to preserve the peace? Did they try to increase production? *Coal Age* is obliged to admit that they spent all their time trying to create trouble in every nonunion district in the length and breadth of the country.

They will doubtless claim that now is the chance. Perhaps it is. The operators might as well say that now is the chance to crush the union. They might trade, like the union, on the need of the country. They might disregard their promises to promote peace, forget they were represented on the Committee on Coal Production, and, like the union men, they might lose sight of their citizenship.

Strange Actions of a Member of Fuel Board

The union, in fact, said the operators would do this. But it is the union men who have ranged the country over seeking trouble. Some time ago we asked, "Is there another John P. White?" There is; indeed there is. It is the John P. White who, having promised at sundry times and in divers manners that he would ensue peace, who, having been given a Government office, goes round the country trying to make trouble.

What would we say if Peabody and Moderwell, after having been put into a similar office to White, went around to bolster up their private ends and spend the time they had dedicated to the country in destroying the union? What color of patriotism would there be in such acts, and what kind of patriots are these men from Indianapolis who give their thought to the interests of their organization rather than to the needs of the nation.

Making Trouble in All Nonunion Districts

It is a paltry piece of business this. White has been to Alabama, Colorado and Wyoming organizing new unions. Agitators have invaded new territory like Greensburg, Johnstown, eastern Kentucky and Tennessee. Everywhere the union has been active. But surely now is the time to put aside labor differences. "After the war" is time enough for them. If the new committeemen can do no better than foster disorder, it is time to write to them for their resignations. Especially is it abominable that the agents utilized to promote the disorder are often alien enemies, hyphenated citizens, men whose interests are the interests of the cruel foe who has murdered our women and children and whose actions have outraged humanity.

The rule of "No Peace Outside the Union" is being clearly exemplified by the button strikes in the northern anthracite field. In the central Pennsylvania nonunion districts strikes are numerous. In West Virginia there is trouble in union and nonunion fields, and in the western Kentucky fields the unions, without marked success, are trying to promote a general strike. In eastern Kentucky and eastern Tennessee the union has threatened to strike if it cannot get higher wages and recognition. The mine workers also ask for an 8-hour day and pay by the ton.

Still Troubling About Buttons

The anthracite region still troubles about buttons. The mine workers who scrapped for freedom to join the union continue to scrap now they have it. Having attained the right to join what organization they please, they now seek to prevent other men from using their discretion as to whether they will join the union.

A thousand mine workers of the Lehigh & Wilkes-Barre Coal Co. at the Hollenback colliery are out on strike to compel the others to pay their monthly dues and wear their union buttons. The Mexicans introduced at the Jermyn colliery of the Delaware & Hudson Co. have proved quite willing to join the union and pay union dues. As they are willing to wear the button, the mine workers are quite ready to extend them the right hand of fellowship, and there will be no strike against them. There are 52 Mexicans at the Jermyn mine.

Seek To Exclude All Men but Their Own

At the Taylor colliery of the Delaware, Lackawanna & Western R.R., Coal Department, 1000 men went on strike on July 18, the difficulty being over the rate to be paid for the removal of refuse from the coal mined.

The meeting of the biennial convention of the northern anthracite field (District No. 1), which convened at Wilkes-Barre July 19 and adjourned July 21, gives an opportunity for us to take stock of the movements in that region and to discover what the mine workers are thinking. The first demand of all is for the closed-shop agreement. There were many who wanted the checkoff also; but after all, if you have the closed-shop, it is easy enough to collect union dues. The mine workers claim that the closed shop would prevent the existence of the Industrial Workers of the World, which the resolution most aptly describes as "a small number of men who are making trouble for the mine owners."

The mine workers claim that the wording of the last agreement gives them the right to a closed shop. But the text of the resolution shows that the conviction is not deep, and if once held it has faded away before the light shed by a further reading of the contract. The resolution says: "The mine workers were of the opinion that the wording of the last agreement gives them a union shop." They may rest assured that whatever future contracts may provide, the one just made, neither in wording nor in intent, gave the closed shop to the mine workers.

The mine workers want the union shop, not the checkoff. They do not want two bites at a cherry. The checkoff can exist with a lot of nonunion labor, but the closed shop ends forever the possibility of free labor.

Yet Their Attitude Evinced Much Patriotism

The salaries of the officials were increased 17 per cent. The food conservation program was indorsed. The by-laws were changed so that no man can be a delegate to the convention unless he has been in good standing for six months prior to the election. A bureau with a chief drawing $2500 a year was formed to aid mine workers' widows and orphans to get what the union regards as the full legal compensation.

The mine workers also declared against working more than 8 hours. The tone of this part of the proceedings was excellent. The men recognize evidently the shortness of anthracite and their obligation as good citizens to get coal out, and so they say no one must work more than 8 hours a day *unless* the district officers authorize an extension of the working time, and the men are paid pro rata for the service thus rendered to the company.

When one realizes how much agitation, expense—yes, and suspense—have been spent on the 8-hour day, the attitude of the mine workers is extremely creditable to them. It is stated that the resolution was aimed at the Pennsylvania Coal Co., which has put on a 9-hour shift at its collieries. The resolution was unanimously adopted.

The foreign mine workers objected to the statements circulating about German money being used to tie up the industry. President Dempsey openly declared that he felt confident that the money was being used.

He said that I. W. W. agitators arrested in Scranton and Wilkes-Barre were able, though they were strangers, to put up $10,000 cash bail on a moment's notice. He quoted Secretary of Labor Wilson as corroborating the statement that German money was being used by some persons to stir up trouble.

The delegates who spoke foreign languages took these statements much to heart, and in a resolution declared that each for himself denied that he was a member of the I. W. W. or a German plotter.

The vote of the convention showed Dempsey's strength. In a party vote on the manner of nomination of the compensation board—by election or nomination of the district board—the vote was 230 to 86. The insurgents had been expected to put up a strong resistance.

The report of the secretary-treasurer showed that in the last two years, 11 new local unions were organized, and that at the present time there was a balance of $106,814.73 in the treasury. In July, 1915, there were 21,125 men in the district union. On June 30, 1917, the number had increased to 31,175 men in good standing.

The following officers were elected: John T. Dempsey, president; Joseph Yannis, vice president; John M. Mack, secretary-treasurer, and Thomas Davis, international board member. The board members are Stephen Reap, first sub-district; James Gleason, second sub-district; D. L. McCue, third sub-district and Peter O'Donnell, fourth sub-district.

Strike Activity in Central Pennsylvania Decreases and Shifts

The labor conditions in the Irwin, Westmoreland County, field were a little improved the past week, though not much, and they are still very unsettled. The Youghiogheny & Ohio Coal Co. mine has continued at work under union conditions. The Keystone shaft of the Keystone Coal and Coke Co. has been working all week with practically a normal force. The two Herminie mines of the Ocean Coal Co., a subsidiary of the Berwind-White Coal Mining Co., were operating all last week with increasing force, reaching about the normal output at the end of that week. It is rumored that these three mines will strike again early in the week for recognition of the union.

The Westmoreland Coal Co.'s mine at Yukon, which was almost idle the latter part of last week, has been working all week with a small but increasing force, having at the end of the week about one-third of its miners and loaders at work. The Whyle Coal and Coke Co., which was entirely idle the first of the week, finally got its full force at work again on a nonunion basis. Edna No. 1 mine of the Pittsburgh & Baltimore Coal Co., a subsidiary of the United Coal Corporation, struck Friday, July 20, for recognition of the union, and Edna No. 2 mine of the same company followed suit the next day. Both of these mines are now idle.

The Export shaft of the New York & Cleveland Gas Coal Co. also struck early last week and is still idle. The sheriff, aided by the state constabulary, has closed all saloons and bars in the vicinity and is stopping all parading. He is keeping a very close watch on the situation, the result being that excellent order has been maintained and there has been no violence.

All firearms and weapons found in the possession of alien enemies are being taken, as most of the strikes seem to be started by that element. The international organizers are located in Greensburg, the county seat of Westmoreland County, but they do not seem as active as they were a week or two ago. Having started the trouble, they seem to be letting it take care of itself.

In the central Pennsylvania field the United Mine Workers seem to be taking on renewed activity, and 13 new organizers, 12 of them foreigners, appeared in Johnstown early in the week and scattered throughout the field. The Valley Smokeless Coal Co. mine near Johnstown has been on strike since the middle of last week, and the St. Michael shaft of the Maryland Coal Co., a subsidiary of the Berwind-White Coal Mining Co., has been operating all week with a much reduced force, owing to trouble started among the Austrian element three weeks ago. Agitation has almost closed down the works of the Ideal and Moxam coal companies. The aim is to unionize the mines and not to correct any real or imaginary grievances. In Somerset County conditions are mostly quiet, there having been a little trouble at Listie early in the week, which seems to have blown over. Here also the recent disturbances seem to have been fomented among the foreigners, who are mostly of Austrian origin.

The activity of the union in starting strikes in nonunion fields during the war is not creditable to the patriotism of its leaders. Since the United States entered the war there has been renewed activity everywhere. The union seems to desire to use the opportunity for securing the extension of its authority into every field. Disturbances caused by this unpatriotic action are not likely to be readily forgiven by the public. The burden of the activity must rest heavily on the treasury of the district union, seeing that the district was recently in hard straits for money. In some way it seems to have arranged for recuperation.

Western Kentucky Strike Abortive

It begins to look as if the western Kentucky strike was not going to be a success. The people in Kentucky believe that this is a poor time for a strike. They do not view the matter like John P. White, who thinks union mines should work steadily and nonunion mines seethe with strikes and disorder.

Still the Kentucky executives are only keeping order. Those who want to work can, and those that don't want to work can abstain. There is no vagrancy law.

Reports from western Kentucky counties in which a strike of union mine workers is in progress indicate that the first three weeks have passed without having caused any marked effect on the output. It happened that there was a better supply of cars than had been the case for some time. Isolated instances of violence were reported, and there was one request made to Governor Stanley during the second week for militia to guard mine property. Governor Stanley came to Louisville, and after inquiring as to the situation, announced that the local authorities had the situation well in hand so far as order and law were concerned and there was no occasion for troops.

Later in the week, however, the Governor changed his mind, and the Signal Corps, Co. A, Kentucky National Guard, was ordered to Princeton, where a clash seemed imminent. These are the only state troops not at this time in Federal service. There are about a thousand white and a thousand negro miners at Providence, and union men who have struck are urging the negroes to quit work. There is much feeling being shown. Citizens wishing to avoid taking sides have refused to serve as deputy sheriffs, and troops seemed to be required. According to Adjutant General J. Stanley Ellis, there is now no probability of trouble at Providence.

At various points in the strike district operators admit that guards are stationed to protect nonunion men who still continue at work, and that strikers have no opportunity to reach them or talk to them. Numerous wild reports are in circulation about machine guns having been placed at mine entrances.

On Saturday night, July 7, unknown persons fired into the mining camp of the West Kentucky Coal Co. Bullets clipped through the houses and there was much excitement but no one was hurt. The company asked Sheriff Winstead, of Webster County, to provide protection.

On Thursday, July 12, Jackson Weathers, a negro union miner, who had walked out of the Panama mine in Henderson County when the strike was called, limped into Henderson and swore out warrants for four white miners and two

colored miners. He was suffering from a wound in the leg and a beating with clubs, and said that the attack was made on him on the day before because he said he would return to work so that his family could have food. The mine was closed when half of the employees walked out.

At Madisonville, Ky., on July 13, Henry Jones, an employee of the St. Bernard Coal Co., swore out warrants for the arrest of Robert Smith, a mine workers' union organizer, charging him with flourishing a deadly weapon, carrying a concealed weapon and with robbery. Smith left, but the deputy sheriffs succeeded in arresting him. He has given bond for $2000. This case and the others heretofore mentioned have been held over till the September terms of court.

Warrants were taken out at Madisonville on July 18, against Sterling Lanier, manager of a coal-mining company at Nortonville, and two of the mine guards, charging them with banding together for the purpose of intimidation and alarming others. The affiants were six union men who declared that the defendants armed with guns, threatened them when they sought to communicate with mine workers in the employ of Lanier's company.

White Admits Sinister Intentions

Three thousand miners, representing only a part of the membership of the United Mine Workers of southern Colorado, gathered at Ludlow, Sunday, July 8, to hear President John P. White.

President White, after explaining the reason for the action of the International Union in taking away the autonomy of District Fifteen, pleaded with the members of locals in the district to beware of internal dissensions.

"As a union," the president said, "we can accomplish that which we all wish and look for; the *establishment of democracy in the coal fields* while the nation, to which the union will remain loyal, as it has always done in times of crisis, is battling in Europe for the establishment of a world-wide democracy."

Mr. White was optimistic concerning the outcome of labor unionism in this crisis. "I look forward to the time which is coming, and coming soon, when representatives of the operating corporations and representatives of this union will meet together in friendly conference to better the conditions of the men and the mines, and to a time when strikes and bloodshed will be a matter of history."

THEY STILL CELEBRATE LUDLOW AND FORGET EAST ST. LOUIS

The panorama gives an idea of the large crowd that heard President White. In the background are the foothills which were the battlefields of the miners and state militia during the strike of 1914. The cross marks the site of the tent cellar where so many women and children lost their lives as a result of the industrial disorder known as the battle of Ludlow. Standing in the third picture are, from left to right, John M. O'Niel, chairman of the rally, President John P. White, Organizer Frank P. Moran and John J. McLennon, president of the Colorado State Federation of Labor.

Mr. White is convicted out of his own lips of an intention to use the war as a weapon to make the union dominate the mining industry. It is time the public realized that Mr. White is not going to maintain the *status quo* during the war, but by making trouble in nonunion districts intends to make unionism supreme.

JOHN P. WHITE CERTAINLY DID NOT LACK FOR AUDITORS WHEN HE SPOKE AT LUDLOW

SAYING THEY WANT TO ESTABLISH DEMOCRACY DURING THE WAR THEY TRY TO START TROUBLE IN COLORADO

Editorials

An Excursion in Business Algebra

COAL is a product which only has to be mined to be put on the market. The real increase in cost to be faced by the coal operator is therefore the rise in wages. It is not the purpose here to suggest that the increase in wage is sufficient in itself to justify the increased cost of bituminous coal in any adequate or nearly adequate measure. For it does not; but neither does the increased cost for coal and other raw materials justify the great increases demanded for many manufactured products.

It is quite customary to say that manufactured articles, being made out of raw materials that have risen in price, are justifiably sold at a larger percentage of increase than has been received by the producers of raw materials. But is this true?

Suppose the items in the manufacture of steel are represented by a, b, c, and so on—a representing the cost for coal, b the cost for iron and c the profit on manufacture. It is not necessary to consider the other items. The total of all is x, and represents the price of the steel. Now,

$$a + b + c \ldots\ldots\ldots\ldots = x$$

Let all the items be increased 100 per cent., including the profit c. Then we shall have the relation:

$$2a + 2b + 2c \ldots\ldots\ldots\ldots = 2x$$

The profit being increased proportionately to the augmentation in the cost of the items purchased and the items purchased costing 100 per cent. more, the price of the manufactured article would be doubled. Many people, however, in an illogical way say that if $a + b + c = x$, then $2a + 2b + 2c = 6x$. They would not write it down that way in algebra, but in business terms they are disposed to urge that the increase in price of a manufactured article may be larger in percentage than the increases in the items entering into the manufacture. There is no truth in that contention; if there is, then algebra is misleading.

The only reason why certain manufactured articles should be sold at a higher percentage of profit than certain raw materials is that the demand for these particular articles is greater than for the raw materials and we wish capital and labor to drift toward the first mentioned industries.

In reference to this point of view the president on July 11 said: "I hear it insisted that more than a just price, more than a price that will sustain our industries must be paid; that it is necessary to pay very liberal and unusual profits in order to 'stimulate production'; that nothing but pecuniary rewards will do—rewards paid in money, not in the mere liberation of the world. I take it for granted that those who argue this do not stop to think what it means."

This is a good sentiment, but it does not seem likely to be effective for the reason that in all the many campaigns inaugurated there has not been a single one to help those businesses which are admittedly in need of stimulation and which help in the war. There is the railroad industry which needs equipment. Has President Wilson yet said: "My fellow countrymen, railroads pay a meager percentage of profit, but they need your help and assistance. We have kept them from making large profits which would have stimulated them. We have kept them even from a price that would have sustained them. But, in view of our need of increased service from railroads it is your plain patriotic duty as good American citizens to buy railroad stocks and bonds and equipment certificates."

Neither the President nor any one of our numerous propagandists has yet made such a statement. Every one is placing his money where it profits most, and what is the purpose of arguing as the President does that black is going to be white after a while? Certainly the President has not taken any steps to change the mind of the public. He has not started the cry, "Base your investments on public welfare not on private profit." Until he does and notes how it works, how can he call for the stimulation arising out of a healthy spirit and neglect that stimulation which has been provided by economic law?

We do not attack high prices in manufactured articles. They have their value and place economically, but neither do we excuse them by a fallacious algebra, nor attack them by imagining an idealism in investment which no one, not even the President himself, has ever advocated.

Open Secrets of the Manufacturer

A STRICT censorship is being exercised by the American press, and as a result the American people know little about their part in the war. But the German government has means of securing the information, and the last place they would look for it would be in our papers. They have details which the largest and most diffuse of metropolitan papers would not care to print, for it is not difficult to obtain all the information you desire if you go about the matter industriously. Especially is it easy for the German government, with its spy system, to find out just what is being done.

Our American manufacturers are just like the officials at Washington. Their business rivals know just what they are doing. It is their business to find out, and they do not for a moment overlook it. Details which wouldn't interest the technical reader or the technical press are duly recorded in private letters sent almost daily to the headquarters of rival manufacturers. But

the manufacturer himself believes he can hide his methods by saying a minimum about them in his own publications and in the technical journals. Thus his rivals know what he is doing and his friends do not. If those who had his machinery knew just how it should be used and how it was constructed, they would use it to better advantage, and it would give better results. If the man who hadn't used it knew just how to operate it and just how it was built, he would be the more ready to advocate its purchase.

Information about a product is an open secret to business rivals, a dead secret to a possible purchaser, and not any too well known to a present user. By being more explicit the manufacturer would increase the number of his friends and not give any aid to his competitors. Why then, when he writes a catalog or an article, does he make it as mysterious as a fairy tale and too often only a pretense at saying something?

Who Was It Cried "Wolf"?

IT HAS been alleged that the coal operators started the coal panic by telling the people that there was a shortage and that a still more severe shortage was impending. Of course, as a corollary, it is said that the operators did this to boost the price of coal.

Doubtless it is true that some operators did declare there was a shortage. All of them, surely, must at times have admitted that fact, and most of them at times anticipated that it would go on increasing so long as transportation continued as inadequate as it has been. But it may be seriously doubted whether they spread the idea as industriously as the officials at Washington or the public in general. In discussing Washington, however, the Federal Trade Commission should be mentioned as a refreshing exception. It has always urged that the conditions were on the way to being bettered and that the public need not be panic stricken.

The Geological Survey sent out a squib urging every one to buy coal at once, though no coal was purchasable, and the President helped the sentiment along in his admirable address of April 16, 1917: "To the miner let me say that he stands where the farmer does: the work of the world waits on him. If he slackens or fails, armies and statesmen are helpless."

These statements were coupled with a shortage which everybody realized and felt. Knowledge of it was so general that no propaganda however sinister could much extend it. The panic was not caused by the persistence of sales agents in spreading rumors. In fact the bigger men in the industry realized that the market would run away, and pleaded with the public to avoid anything resembling a panic. Especially was this true of the larger anthracite men, who kept their prices down and tried to keep the mind of the public normal.

There was no need for the pronouncement of the Geological Survey. This is not a year when the arguments of past years should be repeated. Mines are not closed down now for want of orders, and so there could be no need apparent for the annual cry: "Do your Christmas coal shopping early!" However, one cannot be too declamatory, for the disposition to repeat mottos and admonitions written for an older condition of affairs is so strong and irresistible that we cannot be sure that *Coal Age* has itself always resisted it. The time is soon likely to arrive again when we must advocate coal storage and the study of it now is an immediate necessity, though the practice of it may, with private and public profit, be delayed. The industry is now producing 25 per cent. more coal than last year and may soon be sailing on an even keel.

The unfortunate effect of the incitation to buy coal was seen markedly in Brooklyn, which got 6 per cent. less anthracite than in the year before and needed more for immediate consumption because "winter lingered in the lap of spring," for April was an unusually cold month this year.

A quotation from the report of the Federal Trade Commission on the anthracite situation in Brooklyn is timely:

> When the Brooklyn coal dealers announced their willingness to accept orders for April delivery at $7.50 for egg and $7.75 for stove and nut coal, the result was a buying panic on the part of the householders, who placed orders in great numbers and for tonnages as large as their storage facilities would permit. The result was that during the first 10 days of April practically all dealers booked tonnages for delivery in April for storage alone equal to 200 to 300 per cent. of the amount of business normally done in the whole month of April.

Conditions like these were general, and the head of the Committee on Coal Production, a "coal baron" himself, pleaded with the public to forget coal for a while and the price would fall. The people were like persons with neuritis, whose nerves are constantly on edge because the mind is concentrated on their nerves and not on their immediate duties. If the public had acted normally, the price of bituminous coal would have speedily fallen. The buying public, however, directed its attention to the coal business, and in a fervor for action still further aggravated the conditions it so loudly deplored.

Profit in Reducing Sales

THE Central Coal and Coke Co., of Kansas City, Mo., has found that it pays to show its clients how to use coal economically. Many of the complaints regarding the quality of the coal supplied to industrial plants are made by incompetent firemen and engineers who put the blame on the fuel to excuse their own slackness and incompetency; and then there are some managers who run their plants inefficiently through lack of knowledge and who blame the coal for their own shortcomings.

If coal is only burned to monoxide of carbon, if its heat is lowered by mixing the gases with an excess of air, if the ashes contain an undue proportion of wasted fuel—no coal will give satisfaction. The Central Coal and Coke Co. has found that the fuel bills can be reduced 10, 15 and even as much as 50 per cent. by the adoption of improved methods in the boiler room. The manufacturer, thus saved expense, becomes a warm advocate of the fuel company and a booster for its coal. Thus the "Central" is of the opinion that its principle of helping the consumer first helps the coal operator all the time.

Department of Human Interest

Gary, W. Va., Men Contest in Coal Loading and Coke Drawing

The United States Coal and Coke Co. recently offered prizes to the men who would earn the most money in the loading of coal during the last half of the month. The first prize was $50, and was won by Steve Coimoin at No. 11 works. The prize must have looked somewhat small to a man who was able to make without a bonus as much as $261.05 in the half month, or $20.08 per day.

The second prize was $35, and also was won by a man working in No. 11, Paul Miller by name. His earnings were $245.90 for a fraction over a fortnight's labor, or $18.84 per day. The third prize fell to Frank Markangelo at No. 9. His prize was $15 and his wage $235.54. The average earnings of the three leading men at the 11 collieries was $138.79 for 13 days, or $10.68 per man per day.

At the same time the coke pullers contested for primacy and for prizes of equal value. John Hostin, at

CRACK COAL LOADERS AND THE CHAMPION COKE PULLER AT GARY, W. VA., PLANTS

plant No. 2, drew $117.30 of pay, or $9.02 per day, and was awarded a bonus of $50. At No. 8 Will Kellam drew $113.15, or $8.80 per day. This put him in the second place, and he drew a prize of $35. Pink Kellam, a brother of Will, but working at No. 4 mine, earned $101, or $7.77 per day, making third place and receiving as a prize $15. The average earnings of the three best men at the seven oven plants were $74.97 for 13 days, or $5.77 per day per man.

The picture shows the three winners in the coal-loading contest, the best man in the coke-pulling competition and Mr. Mace, the assistant to the general superintendent, handing out the checks. The prizes were given on July 4 at the ball ground, during the intermission when the best ball team of Gary played a semi-professional team from Cincinnati, Ohio. Where miners get steady work they make good wages, but probably there are few who make as much as the employees of the United States Steel Corporation's subsidiaries of which the United States Coal and Coke Co. is one.

EARNINGS OF THE THREE BEST COAL LOADERS AT EACH PLANT OF THE GARY MINES

Name	No. of Cars	Rate	Days	Rate	Slate	Rate	Total Earnings
No. 2 Works							
K. Kolony	117	$1.02	3.0	$2.55	..	.....	$126.99
G. Belone	103	1.11	.....	.....	13	$0.84	125.25
L. Sabo	95	1.04	2.0	2.55	10	.84	112.30
No. 3 Works							
J. Heedo	114	.73	2.4	2.50	..	.....	89.33
J. Seko	96	.80	18.0	.....	18	.55	86.70
S. Rinko	47 27	.85 .73	8.0	2.50	3	.55	81.59
No. 4 Works							
P. Clinchook	152	1.11	1.0	3.00	3	.84	174.64
S. Miller	150	1.11	.....	.....	9	.84	174.06
J. Kromba	95	1.11	1.0	2.55	6	.84	113.04
No. 5 Works							
F. Lasos	50	1.37	1.0	2.55	55	.84	117.25
P. Blink	64	1.37	1.0	2.55	29	.84	114.59
S. Borsus	51	1.37	1.0	2.55	50	.84	114.32
No. 6 Works							
T. Hajeck	131	1.11	1.5	2.55	..	.....	149.39
J. Sabinsky	102	1.11	1.0	2.55	..	.....	115.77
A. Hajser	83	1.11	0.6	2.55	..	.....	93.86
No. 7 Works							
S. Kozlske	96	1.11	0.3	2.55	..	.....	107.41
W. Karbovich	87	1.04	3.3	2.55	8	.36	101.01
F. Near	68 33	.97 1.04	....	.....	..	.....	100.28
No. 8 Works							
W. Skarino	115	1.15	0.5	2.55	5	.84	137.87
B. Slovak	62	1.05	.....	.....	28	.84	91.17
Z. Rugan	64	1.11	4.0	2.55	6	.84	86.28
No. 9 Works							
F. Markangelo	209	1.11	1.0	3.00	1	.55	235.54
D. Paron	194	1.11	1.6	2.55	..	.....	219.59
S. Darboldi	205	1.11	2.4	2.55	..	.....	233.78
No. 10 Works							
N. Carper	168	1.11	2.5	2.55	1	.55	193.55
A. Dodaney	96	1.11	8.0	2.55	...	.....	126.96
M. Simms	100	.85	1.0	2.55	30	.55	104.05
No. 11 Works							
S. Coimoin	240	.95	13.0	2.50	1	.55	261.05
P. Miller	247	.95	2.0 1.0	4.10 2.50	1	.55	245.90
P. Pope	88 161	.90 .95	....	.....	..	.....	232.15
No. 12 Works							
J. Drake	110	1.11	....	.....	..	.....	122.10
J. Scolgal	90	1.11	.....	.....	..	.....	99.90
E. Lester	80	1.11	2.0	2.50	..	.....	93.80

EARNINGS OF THE THREE BEST COKE PULLERS AT EACH PLANT OF THE GARY MINES

Name	Ovens	Rate	Ovens	Rate	Total Earnings
No. 2 Works					
J. Hostin	41	$1.55	43	$1.25	$117.30
D. Hostin	13 98	1.55 .16½	7 17 Days at	1.25 2.75	91.82
J. Hostin	12 293	1.55 .16½	10 1.8 Days at	1.25 2.40	83.98
No. 3 Works					
E. Young	50	1.25	17	1.55	88.85
W. Young	38	1.25	15	1.55	70.75
A. Jones	30	1.25	18	1.55	65.40
No. 4 Works					
P. Kellam	20	1.55	56	1.25	101.00
N. Kellam	16	1.55	36	1.25	69.80
D. Kellam	13	1.55	32	1.25	60.15
No. 5 Works					
S. Hodge	19	1.55	49	1.25	90.70
C. Wade	14	1.55	36	1.25	66.70
L. Nacne	13 ...	1.55	25 1.3 Days at	1.25 2.40	54.60
No. 6 Works					
J. Mills	9 219	1.55 .16	20 3 Days at	1.25 2.40	81.19
T. Mills	13 ...	1.55	37 1.8 Days at	1.25 2.40	70.93
J. Moore	11 ...	1.55	19 1.4 Days at	1.25 2.40	44.27
No. 7 Works					
W. Wilburn	17	1.55	37	1.25	77.60
J. Santos	11 ...	1.55	15 14.7 Days at	1.25 2.40	71.27
E. B. Rose	8 ...	1.55	21 0.6 Days at	1.25 2.40	40.25
No. 8 Works					
W. Kellam	6 ...	1.00	51 28	1.25 1.55	113.15
G. Hall	34	1.25	12	1.55	61.10
J. Martin	25	1.25	14	1.55	53.60

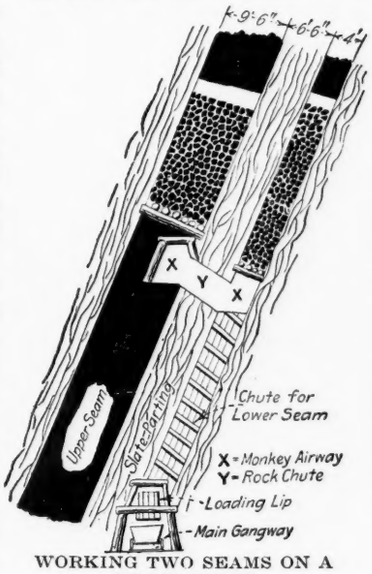
Discussion by Readers

Working Contiguous Pitching Seams

Letter No. 4—Kindly permit me to submit a plan for the working of the 9½- and 4-ft. coal seams separated by 6½ ft. of slate and piching from 60 to 75 deg., as described in *Coal Age*, May 26, p. 930. This plan has been tried out and proved to be a success, but care is required in doing the work right.

The first question to be decided is whether it is possible or feasible to work these two seams together by taking out the slate with the coal. There are 13 ft. 6 in. of coal to 6 ft. 6 in. of slate, which makes over 32 per cent. of refuse to be handled in the excavation. Since this is too much for economical operation, it will be necessary to work the two seams separately.

In order to secure a maximum extraction of the coal in these two seams they must be worked by the retreating system. For this purpose, the main gangway is driven to the boundary line in the lower seam, taking some of the top and bottom rock to give the required width of road. The position of this gangway and the "monkey airway" 30 ft. above it in the same seam is shown in the accompanying figure. From the monkey airway, a rockhole is now driven to the upper seam, on a suitable inclination to form a chute, and a second monkey airway is driven in the upper seam, on this level. All of these airways and the main gangway are driven to boundary line. They are connected by chutes and rockholes, at regular intervals, for the purpose of ventilation.



WORKING TWO SEAMS ON A STEEP PITCH

The work of opening the breasts is started at the boundary line, by driving five chutes and manways up from the gangway in the lower seam. The breasts are driven on 50-ft. centers and opened to a width of 24 ft. They are driven up a distance of, say 240 ft., with four cross-headings in each of the pillars separating the breasts.

The breasts must be kept full, only sufficient coal being drawn to give the miners headroom at the face. When these five breasts are finished five more are driven in the upper seam, directly above the first five in the lower seam. These breasts are also kept full of coal. Next start five more breasts in the lower seam, and when they are finished drive the five breasts above them in the upper seam.

There are now ten breasts standing full of coal, in each seam, and the work of drawing the pillars is started in the lower seam by driving a hole up the center of the pillar between the two breasts next to the boundary line. The hole is driven from the gangway to the monkey airway above, where a rockhole is made to the upper seam. Now, pull the coal in these two breasts, in the upper seam, and drive pillar holes and shoot the pillar between these two breasts, working from the top downward. The work on these pillars must not be delayed.

While the coal in the upper seam is being loaded out, the work of driving pillar holes is started in the lower seam; but these pillars should not be fired until all the coal is out of the upper seam. The breast runs can then be started and the pillars fired in the lower seam, working from the top downward, as before. It is possible that a fall of middle slate may occur in spite of every precaution, but where the work is properly done and there is no delay this will happen but rarely.

The work must all be done on the retreating system and the first mining carried on rapidly enough to keep the new work not less than five or more than ten breasts ahead of the robbing. The success of the entire operation depends on keeping the robbing close on the heels of the first mining and using every precaution to disturb the middle slate as little as possible.

Referring now to the methods employed in driving the gangways and opening the manways and chutes, one manway may be made to serve two chutes; but it will generally be better to drive a separate manway for each chute, and this can be used later as a pillar chute. It will be understood that the coal in the upper seam is run out through the rockchute and the loading chute in the lower seam, by which it is loaded into the cars standing in the gangway.

The loading chutes are built in the ordinary manner, with a check-battery to control the movement of the coal in loading. I have arranged the loading lip over the center of the gangway, and it will be necessary to lag the gangway timbers heavily at this point. In this arrangement the loading lip is constructed at right angles to the line of the chute and in line with the center line of the gangway. This lip should have a pitch of 35 deg. and be long enough to reach within 18 in. of the top of the car. In this connection the details of constructing a loading chute, as described by F. L. Parker, *Coal Age*, Vol. 10, p. 1021, is of interest.

The question of ventilation is not a difficult one, since the monkey airways furnish the means of deflecting the air into the breasts, in both the upper and lower seams. The main gangway is the intake, while one or both of the monkey airways form the return.

WILBUR L. CROSS, JR.,
Minersville, Penn. Mining Engineer.

The Negro, North and South

Letter No. 4—Kindly permit me, as an interested reader of *Coal Age* and one who has been greatly benefited by the information given in its columns, to say a word in explanation of the conditions that have led to the exodus of the negro from the cotton fields and industries of the South to the northern and eastern parts of the country.

It has been very amusing to the people of the South to read what different people north of the Mason and Dixon line have to say relative to the treatment accorded the negro in the South. In fact, conditions described by these writers are so far-fetched and ridiculous that even the educated negro of the South has found sufficient amusement to induce him to continue reading the contributions of these writers.

We of the South, while deploring the recent trouble at East St. Louis, are not at all surprised that developments should have taken that turn. We have been brought up with the negro. As children on the farms the negro children have been our playmates and, as men, the negro is still our friend.

The Friendliness of the South

In common with nearly every Southern man, I count among the negro race many of my warmest friends. However, unless one has been brought up in the South and understands the negro and the conditions of his relations with the white man in the South, it is almost impossible for him to understand the negro's place and social status in the South.

In some sections here, the negro outnumbers the white man ten to one, while in other parts the white man is outnumbered but two to one by the negro. Now, when it is understood that the average negro, in fact, the great majority of his race, are the most shiftless and dependent people of which one can well conceive—a race that is entirely dependent upon the white man to do their thinking—it is easy to believe that among such people the majority are of criminal tendencies, and too often commit crimes that make them a menace to their own race as well as their white neighbors.

We used to hear much said on the so called "negro question." The expression originated north of the Mason and Dixon line and its discussion was almost wholly confined to that section, as the question did not appeal to us here in the South in the same manner as it seemed to be viewed in the North.

The South Understands the Negro

Understanding the negro from the top of his head to the sole of his foot, we do not have to be told by our Northern friends why the negro has left the South in large numbers. The truth of the matter is as follows:

The negro, being told by Northern labor agents of "a land flowing with milk and honey"—a land where he will be permitted to intermarry with the white race and be treated on an equal basis socially with the white man, is readily duped. The negro is naturally credulous. It is his disposition to believe anything a white man tells him, and he gives up his friends, his home in the Southland, the beautiful Southern climate where he has been reared as the ward of the white man, and strikes out for the promised land.

Again, labor being very scarce north of the Mason and Dixon line, it is easy to see how those in need of labor are ready to use the negro in the absence of better workers. But, let me ask, What will become of our black friends when foreign labor is again plentiful in the North? Will there then be the same need for the negro? He saves nothing, he produces little, and we wonder who will furnish him the funds to come back to his Southern home.

We believe it is providential that the negro, in large numbers, has gone to the North, where the good people of that section will have an opportunity to solve the great "negro question," which they have long imagined was a menace to the South. SOUTHERNER.

Coleanor, Ala.

Mine Foremen and the Wage Increase

Letter No. 1—Allow me to refer to the report of the subcommittee of the Operators' and Miners' Conference, held in New York, Apr. 17, 1917, which was published in *Coal Age*, Apr. 21, p. 712.

Among other items, this report provides that "all day labor now receiving $2.98 and $3 per day be advanced to $3.60 per day," and further that "monthly men and all other classes of labor employed in and around the mine be advanced 60c. per day, except as follows: Trappers shall receive $1.90 per day, and all boys now receiving $1.57 per day or less shall be advanced to $1.90 per day." The report states that "no advance shall be paid on deadwork or yardage," and adds, "This advance shall become effective Apr. 16, 1917, and continue until Mar. 31, 1918."

The mine foremen in eastern Ohio have not received the advance provided by this report for "monthly men." In general, mine foremen have received an advance of about $10 per month, which is but little more than half of that accorded organized labor employed by the month.

The Mine Foreman an Intermediary

As is well known, the mine foreman occupies a rather unique position. He must act as a go-between, or bumper, to absorb the frequent shocks between the operator and the men. For this reason, he is not permitted to join the ranks of organized labor and only shares in an incidental way in the benefits derived by that organization.

A few references showing the wages earned by the men in his charge will make clear that the mine foreman is not being treated fairly. While he has been loyal to his employer and has had many unpleasant duties to perform by reason of his office, his services have not been so fully appreciated as they deserve. It would seem that an unfair advantage has been taken of his isolated position in the company. The long hours he is compelled to work and his responsibilities have not been given due consideration in the present crisis.

When men are scarce and work plentiful, as at the present time, it requires all the diplomacy of which a foreman is capable to hold his men and satisfy them. He must listen to all their complaints, real and imaginary. His nights and Sundays are not his own, as he must be ready to answer a call at any time. There are many instances where loaders have earned $100 in two weeks, and it is never difficult for a good loader to

draw higher pay than his foreman. The same is true of machinemen, who have always earned bigger wages than the foreman.

Is there any reason, let me ask, why there should not be greater equality in respect to wages, or can this disparity be explained in any reasonable way? Let me add, in closing, that the foreman in a large mine is a very busy man, and should be compensated in proportion to his responsibility and capability. It is hard, indeed, for a boss to be truly loyal to his employers when the men in his charge are able to draw higher pay and work less hours, with less anxiety and trouble.

Eastern Ohio. MINE FOREMAN.

The Carbide Lamp in Blackdamp

Letter No. 4—The recent references to the action of a carbide lamp in blackdamp calls to mind an experience of my own that I shall always remember. Before describing this experience, let me remark, what is well known to be a fact, that blackdamp as found in mines is quite variable in character and composition. This may account for the differences of opinion expressed by different writers in regard to its effect on the carbide light.

My experience at different times causes me to regard the carbide flame as the most "gritty" of any lamp flame I have ever used. By this I mean that it is the most tenacious, the lamp holding its light where other lamps fail to burn. I have known the carbide flame to flutter, scream and roar, so to speak, in an atmosphere where it was difficult to hold a light. In this connection, the following incident will be of interest:

A MINE GENERATING LARGE QUANTITIES OF BLACKDAMP

Some years ago, I was asked to go and look at a mine that generated large quantities of blackdamp. Owing to the carelessness and neglect of the foreman to maintain a sufficient circulation of air, the mine had more than once filled with blackdamp, so that it was impossible to enter the drift mouth. Upon reaching the mine, on this occasion, I found it closed. The foreman was busy preparing a large fire of coals on a sheet-iron pan. He explained that he was going to carry the fire about 30 ft. inside the mouth of the mine for the purpose of drawing out the blackdamp.

On examination, I found that it was impossible to hold a light in front and outside of the mine entrance. Even a match would not light when struck close to the floor just outside the opening. In spite of my warning that it would be useless to carry the pan of fire into the mine, the foreman persisted, and succeeded in getting it 5 yd. inside the entrance, only to find that he had no fire, for the coals were black and dead as though they had been deluged with water.

Further examination showed me that a board stopping had been recently built in the very opening where they could hope to secure better ventilation for the mine. The foreman, however, refused to open this stopping, as I suggested, although he admitted that since building this stopping it had been impossible to maintain a light in the mine.

Not wishing to interfere with the foreman, I sought the operator, whom I found in the store, and explained to him my understanding of the conditions. In response to his question as to what it would cost to remedy the trouble, I replied, "It will cost you nothing if I fail; but if I succeed in ventilating the mine the charge will be $3 and the price of a flashlight." To this he readily agreed, having already spent about $200 in the sinking of an airshaft which was not yet completed.

The following morning I went to the mine, where I found the conditions the same as before. However, we succeeded in making an opening in the stopping which the foreman had refused to disturb the day before. This done, we left the mine, and the foreman asked, "What will you do next?" I replied, "We will come back tomorrow morning," and locking the gate at the mouth of the mine, left the place.

The next morning we walked into every place in the mine, although the oil lamp that the foreman carried burned very dim. At my suggestion, carbide lamps were used and the mining of coal begun. But, what is of particular interest in this discussion, is the manner in which these carbide lights acted at times.

PECULIAR EMISSION OF GAS

A close examination of the workings convinced me that the blackdamp issued from the freshly exposed working face in puffs, irregularly, very much as the puffing of a steam engine. Between the puffs the lights would burn well, and when a puff of blackdamp occurred, as it did at intervals, the lights would hiss and roar. For a time the flame would leave the spout of the lamp and be separated from it by 1½ or 2 in., but the light was seldom extinguished.

During these puffs of blackdamp, it was often difficult to breathe. So interested was I in observing these effects that I gave them more attention than the mining of the coal. Strange as it may seem, none of the men or myself felt any ill effects from breathing the blackdamp, but we could not work continuously because of the puffs. When these occurred gas was so strong that we were compelled to cease work for the time.

Macdonaldton, Penn. JOSEPH A. GREAVES.

Practices in Blasting Coal

Letter No. 6—In considering what methods and practices are or should be employed in blasting coal, regard must be had not only to the mining law governing such practices but to the conditions existing in the seam, as well as the purpose for which the coal is to be used.

The law of Pennsylvania relating to the mining of bituminous coal is very explicit, and it is not necessary to say more in that regard than to state that if the provisions of the law were strictly obeyed there would not be as many accidents recorded.

CONDITIONS MUST LARGELY DETERMINE PRACTICE

Speaking of conditions in the seam that affect the practice of blasting coal, I want to refer to three classes of mines in which the workings vary materially. In the Pittsburgh district, for instance, the coal in most of the mines is worked from slate to slate, or from the bottom of the coal to the top of the seam. The coal is undercut with various types of coal cutters.

In a room 24 ft. wide, it is not uncommon to find the Sullivan or Harrison coal puncher at work. The

coal, after being mined with this machine, can generally be shot down by one tight shot and one butt shot. Only two shots are required here, for the reason that the coal is well mined and parts readily from the top slate overlying the seam. The top slate will average about 12 in. in thickness.

Shooting Coal That Is Well Mined

The general practice, in shooting this coal to attain the largest percentage of lump, is to drill what is called a "sumping," or "tight shot," about 18 in. from the rib, on either side of the room. Although contrary to the usual custom, I prefer to place this first shot on the gob side, believing that it gives better results than when placed on the road side of the room. This first shot is sometimes called the "breaking-down hole."

The remaining shot is now placed close to the other rib but, before shooting this second hole, the first shot must be sheared clean back to the depth of the undercut. While doing this, it is generally necessary to set one or more posts to guard against accidents from falls of roof, which are liable to occur.

When Mining Is Done by Chain Machines

In another system of mining, the coal is undercut by chain machines of the Morgan Gardner or Jeffrey type, which make a 5½-ft. cut. Coal cut with these machines usually gives better results when three shots are employed to blast it down. The first shot is drilled and fired at about the middle of the room, and must not be too heavily charged. Having squared up the center shot, two rib shots are fired, one on each side of the room. These are arranged in the same manner as the second shot in the system just described. These systems, or methods, of shooting coal can be applied in most cases where the entire seam is worked from bottom to top.

Again, in the mining of the thicker seams of coal, ranging from say 8 to 10 ft. in thickness, it has been customary to drive the openings from 7 to 8 ft. high, and leave up from 18 in. to 2 ft. of roof coal, which often requires much dressing and chipping after the shots have been fired. In these thicker seams, most narrow places 10 or 12 ft. wide require three shots, a center shot followed by rib shots on either side. Here, also, there is much dressing and chipping required. Owing to its general inferior quality, the roof coal is never recovered.

I am reminded now of another type of mining machine that cuts the coal above instead of in the bottom of the seam. In this case, the coal is blasted by a lifting shot, which appeals to me as an ideal method, in mining thick seams, for two reasons. It not only reduces the amount of dressing and chipping necessary after the shots are fired, but the shattering effect of the shots on the roof is avoided, as the charge is fired in the bottom of the seam.

The practice of shooting coal successfully appears to me to belong in a class by itself and to be governed solely by the conditions and requirements, in respect to the kind of coal desired, as determined by the purpose for which it is to be used—for making coke, generating steam or producing gas. These requirements will determine largely the methods of mining and shooting that should be employed in getting out the coal. Experience and judgment are required to produce a larger percentage of lump or a greater proportion of broken coal that is better adapted to the manufacture of coke. To obtain the best results, a good shotfirer of experience and judgment should be employed, and he should have under him continually a man learning the game.

West Leisenring, Penn. LUMEN.

Prosperity and Booze

Letter No. 3—I was glad to see the question of the effect of the drink habit on the coal industry brought forward for discussion in *Coal Age*. I feel that if those in authority could see the consequences that the drink habit has on workers and realize to what extent coal mining and other industries are affected by this evil there is no question but immediate and effective steps would be taken to drive liquor out of the country.

At this time, when the Government is doing everything to stimulate and encourage business of all kinds, and the President, in his address to the nation, has urged the importance of the farmer and the miner in the present crisis, it would seem that there can be no more opportune time than *now* to stop the manufacture and sale of liquor and prevent the inroads that the vile stuff is making in the prosperity of the country.

The Coal Miner and the War

If, as the President has given us to understand, the coal miner is just as essential to the successful conduct of the war as the soldier himself, it is important that the efficiency of the miner should be given the same attention as the training of the soldier. Let us glance for a moment at the facts as they appear today.

The Government is urging all coal operators to work the mines to their utmost capacity. The miners' wages have been increased and coal companies are doing everything in their power to make the miner's home life more attractive and improve his working conditions. In return, what is the miner doing on his part? Is he producing more coal today than before? I venture the assertion that he is not and, in support of this opinion, let me cite an instance of my own observation, which occurred only a few weeks ago.

Payday and the Miners' Booze

Monday was payday at our mine, and I determined to observe closely the effect of this circumstance on 10 men, taken at random, as being the average of mine workers. These men were engaged on the work of drawing pillars and entry stumps, on a single heading. Monday morning every man was in his place, and all worked until a little after noon, when they quit. Tuesday but three of these 10 men reported for work. Wednesday four came to work, but one returned home because his buddy failed to appear. Thursday five worked all day, and Friday there were six at work. The week ended Saturday, with eight of the 10 men in their places.

The following week, two of the men did not work at all, and when they finally showed up at the mine the bottom had lifted so badly that it was impossible to get a car into their place. One whole day was lost

in taking up bottom, for which they demanded pay but did not receive it, as the fault was their own and they could not complain.

Here was an instance where, at least, 25 shifts were lost to these ten men, in a single week. Counting 5 tons per man per shift as the average output of coal, this would mean a loss of 125 tons in output to the company and a revenue of nearly $120 to the men. These are but a few of the things with which a mine foreman must contend.

What Is the Mine Foreman's Remedy?

It may be suggested that men who are so irregular and have so little regard for their work should be discharged; but the mine foreman has his own reasons, and they are good ones, why he cannot always do this. It may be argued, further, that drink is not the only cause of this delinquency. My observation, however, convinces me that 99 per cent. of the trouble is due to the drink habit.

Reflecting on these conditions and results, it would seem that a large class of miners do not appreciate what is done for them, and the more money they are able to make the more they spend for liquor and the more time they are idle. While the farmer is doing his share to meet the need of the present crisis, many of the miners are giving little heed to the situation and, instead of the output of coal being increased during the war, there is a grave fear that the supply will be short and not equal to the demand.

Improved Conditions Not Appreciated

Speaking of the efforts of coal companies to improve both the living and working conditions of their men, let me say that our company recently spent thousands of dollars repairing and painting houses, fixing up fences, laying walks and making other improvements. A large dairy barn has been maintained, and this is stocked with the finest of cattle, to provide pure milk for the workmen. At the same time anyone is allowed to keep his own cows, and pasture is furnished them free of charge. As a result, any man who chooses can make good money at our mine, but the majority of the men are not working more than two-thirds of the time.

Before closing, I want to mention another thing in connection with the drink habit. There is a kind of drink sold to many of the men hereabouts called "Hauffman," or "Kauffman," drops, while others drink ginger mixed with hard cider. The effect is worse than that of whiskey and is ruinous to the health of many of these men. It would seem that the selling of such poison is in violation of the law and should be stopped.

Heilwood, Penn. Thomas Hogarth.

Spreading Mining Information

Letter No. 1—I was glad to read the article of Sim C. Reynolds, "Spread the Light," *Coal Age*, June 2, p. 942. Mr. Reynolds makes a pertinent suggestion when he says that the bulletins issued by the Federal Bureau of Mines, giving information that is of particular value to miners, should be printed in the different languages spoken by these men.

It is well known that a large proportion of the men who should profit by the information contained in the "Miners' Circulars" issued by the Bureau are foreigners who cannot read or speak the English language. Although these are the men for whom the information is chiefly intended, strange to say the circulars have as yet been printed only in English.

Nearly two dozen of the circulars have now been issued. They contain much valuable information in reference to the handling of explosives, the placing of shots in blasting coal, the charging and firing of holes, the use of fuse and squibs, the proper method of thawing dynamite and many other matters of interest to coal miners. The bulletins also draw attention to the numerous unsafe practices of miners and the avoidance of accidents due to carelessness or ignorance.

I indorse all that Mr. Reynolds has said in regard to spreading this information more widely. It is to be hoped that the Bureau of Mines will notice this suggestion and take means of printing the information in the different languages spoken by the men.

Cage Accident Not Due To Neglect of Company

In the same article, Mr. Reynolds inadvertently placed a certain group of mine officials, who are doing everything in their power to make their operations safe, in a bad light by his reference to the cage accident in which thirteen men lost their lives. Had Mr. Reynolds not, as he says, "missed the coroner's inquest" on this accident, he would have learned that it was not the "company's negligence," and that the fault was not due to the weakness of the cage. The thirteen men who crowded the cage that morning, carrying their tools and a box of dynamite, were violating the state mining law, which forbids more than ten men being hoisted or lowered on a cage at one time.

It may never be known just what caused the accident, but it was not the explosion of the dynamite, as is proved by the fact that a number of sticks of the explosive were found later on the broken cage and in the shaft. Everyone knows that if the dynamite had exploded in the box there would not have been a stick remaining.

Cage Overcrowded But Not Overloaded

The suggestion that the cage was loaded beyond its strength is easily disproved, as the same cage was hoisting regularly a loaded car of coal weighing 3½ tons, or 7000 lb. Even assuming that each of the thirteen men killed weighed 250 lb., which is not probable, the box of dynamite 50 lb. and the tools, say 700 lb., the entire weight on the cage would not have exceeded two tons, or 4000 pounds.

Let me say in closing that, to my knowledge, the cages in this shaft are examined daily by three different men. The engineer in charge must examine the cage each day. Also, the mine blacksmith and the carpenter each makes his examination every day, to see that the cage is in good condition. This fact alone proves that the company was not negligent or careless regarding its equipment. The cause of the accident must be sought in some such occurrence as would result from the overcrowding of the cage with men carrying bars, drills and picks. As stated previously, the exact cause of the accident can only be surmised.

Nanticoke, Penn. William A. Barrett.

Inquiries of General Interest

Reducing Voltage for Use in Mine

Kindly inform me of the most economical and practical method to adopt for reducing the voltage of an electric current taken from a traction line, to a suitable voltage for driving cutting machines in the mine.

The traction line supplies a current of 500 volts direct current that is fairly steady, and we desire to reduce this to 250 volts direct current, for the purpose of operating two electrical coal cutters of the chain or puncher type. The distance from the traction line to where the power is used in the mine is about 600 ft., and the power will be transmitted by a No. 6 copper wire.

Fairmont, W. Va. ENGINEER.

The most practical method to adopt in making this reduction in voltage is to install a motor-generator set. The current should be transmitted, at the full voltage, from the traction line to a substation located at the nearest practicable point to the working face. At that point a 500-volt motor should be installed to drive a 250-volt generator.

This question should be submitted to manufacturers before such an installation is attempted in order to secure their judgment and recommendations, in respect to the requirements. By this means much time and expense will be saved. In any case, when making such an installation, regard should always be had to the future development of the mine and the possible power requirements. It should be remembered that as the development progresses and the working faces are advanced it will generally be necessary to move the substation forward to a point where the power can be more conveniently distributed to the machines.

Results of Washing Coal

Can you give me any information or refer me to a publication containing data relating to the reduction in ash and the sulphur content it is possible to obtain by washing bituminous coal? As the question is one of much importance, and as the results observed at different washeries are so variable, I would be glad to find something authoritative on this subject. It would be of great interest to learn what results had been obtained in the washing of coal by readers of *Coal Age*.

Bethlehem, Penn. FUEL ENGINEER.

One of the best publications to which we can refer this correspondent, in respect to the results obtained in the washing of coal, is Bulletin No. 69, issued in 1913 by the Engineering Experiment Station conducted by the University of Illinois, at Urbana. The bulletin is entitled "Coal Washing in Illinois." It is written by F. C. Lincoln, assistant professor of mining engineering at the university, who gives a complete analysis of the subject, rehearsing briefly the history of coal washing, the different kinds of washeries employed, their purpose, method of operation and the results obtained.

It is true, as stated by this correspondent, that the results obtained at different washeries are quite variable. This is owing probably as much to the objects sought to be accomplished and the character of the material treated as to the different methods and appliances employed; although a careful study of different washeries will show that they are not alike efficient.

The object sought to be accomplished by the washing of coal is to remove as much as possible of the impurities in the coal, and, by this means, reduce the quantity of ash and sulphur in the product. Incidentally, the calorific power or heating value of the coal is increased by the removal of these impurities. The reduction of the ash and the removal of sulphur are important factors in many operations in which coal is employed, while the increased heating value of the coal is an important fuel consideration.

In order to give "a fair idea of the general effect of washing, as practiced in Illinois," Mr. Lincoln has compiled in his bulletin, in Tables 13, 14 and 15, the results obtained by ten washeries, operating in different coal fields in the state and treating coal from two different beds or seams. These tables show the percentages of ash and sulphur and the heating value of numerous samples taken across the working face of the coal bed and excluding shale and sulphur partings, which the miner is supposed to remove.

In another column of the tables are shown the percentages of ash and sulphur and the heating value of mine-run coal, lump and screenings, before washing. In other columns of the same tables are shown the percentages of ash and sulphur and the heating value of the screenings after washing, including five different sizes of screenings. Summarizing the results shown by these tables, Mr. Lincoln states as follows:

> The general effect of coal washing, as practiced in Illinois, is therefore to bring the ash and British thermal units in the screenings back to those in the face samples and in the lump and to make the sulphur content slightly less than in the face and lump. Disregarding the slight improvement in sulphur content, it might be said that all the Illinois washeries are doing at present is to bring the screenings back to the condition in which they would be in the beginning if mined with the greatest possible care. This is hardly a fair statement of the case, however, since the additional cost of mining so as to exclude all particles of roof and floor and all thick partings would, in most cases, greatly exceed the cost of washing. Moreover, the larger washed sizes are now better than the face, and the smaller sizes would be made so if the demand was sufficiently strong.

To fully appreciate the value of these data, one should read the entire bulletin, which is the best information on this subject yet published. An interesting feature of the bulletin is a bibliography and chronology of coal washing in Illinois. *Coal Age* will be glad to receive further comments on this subject and the results obtained by those who have operated coal washeries. We hope that the discussion of the subject will be continued, as it is one of growing importance.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—For what reason does the fireboss travel with the air when making his examination of the mine in the morning?

Ans.—It is important that the fireboss should start his examination on the intake air, beginning at the foot of the downcast shaft or the mouth of the section of the mine that he is to examine and proceeding in order with the air current. The purpose of this is to enable him to determine exactly and at once the source of any gas that he may discover.

If he was to begin his examination on the end of the air and proceed against the current, upon finding gas in a place, he would be unable to tell where it came from, until he had traced it to its source, which might prove to be close to the intake end of that split.

Furthermore, by proceeding against the air the fireboss is liable to run into a dangerous body of gas, from which he would have difficulty to escape. In all cases, gas must be approached from the intake end, which always affords a safe avenue of escape.

Ques.—Explain the difference between a 10 per cent. pitch and a pitch of 10 degrees.

Ans.—A 10 per cent. pitch is one having a vertical rise of 10 ft. in each 100 ft. of distance. In seams of moderate pitch, say less than 10 or 15 deg., it is customary to measure all distances in the horizontal plane. In that case a 10 per cent. pitch would mean a rise of 10 ft. in each 100 ft. of horizontal distance.

On the other hand, in steeply pitching seams, it is customary to make all measurements on the pitch, in which case a 10 per cent. pitch would mean a rise of 10 ft. in each 100 ft. of slope measurement.

A pitch of 10 deg. means that the seam is inclined at an angle of 10 deg. with the horizontal plane. When finding the angle of inclination corresponding to a given pitch, in highly inclined seams where the pitch is based on slope measurement, the percentage of pitch, expressed decimally, is the sine of the angle of inclination. Thus, the angle of inclination corresponding to a pitch of 15 per cent., in this case, would be the angle whose sine is 0.15, or 8 deg. 38 min., nearly.

On the other hand, where the percentage of pitch is based on horizontal measurement, the angle of inclination corresponding to a 15 per cent. pitch is the angle whose tangent is 0.15, or 8 deg. 32 min.

Ques.—What are the dangers connected with the use of permissible powder?

Ans.—The chief danger in connection with the use of permissible powder is the tendency of the miner to use too great a charge. He does not realize that the powder possesses a greater strength for the same weight of charge than black blasting powder. According to the definition of a permissible powder, given on pages 5 and 6, "Miner's Circular 2," issued by the Federal Bureau of Mines, a permissible explosive ceases to be such when the quantity of powder used in a single charge exceeds 1½ lb., or does not conform in other respects to the conditions governing its use, as explained by the Bureau.

Ques.—With a fan 8 ft. in diameter, making 250 r.p.m. and passing 62,000 cu.ft. of air per minute when the water gage stands at 1 in., what is the equivalent orifice?

Ans.—The value of the so-called "equivalent orifice" is measured by the formula for the flow of air through an orifice in a thin plate and is based on the ratio of the quantity of air passing to the square root of the pressure or water gage producing the circulation. In this question it must be assumed that the water gage given is that caused by the resistance offered to the air flowing through the mine beyond the point where the gage is taken. The corresponding equivalent orifice would then be

$$A = \frac{0.0004Q}{\sqrt{w.g.}} = \frac{0.0004 \times 62{,}000}{\sqrt{1}} = 24.8\ sq.ft.$$

If the question intends to ask for the equivalent orifice of the fan, however, the answer will be more difficult. It is necessary then to calculate the theoretical water gage due to the peripheral speed (u) of the fan, which in this case is $u = 3.1416 \times 8 \times 250 = 6283$ ft. per min., or 104.7 ft. per sec. The theoretical water gage due to this speed of the fan is $w.g. = 0.0144u^2/g = (0.0144 \times 104.7^2) \div 32.16 = 4.908$ in. Now, if the effective water gage in the fan drift is only 1 in., the water gage corresponding to the pressure absorbed within the fan itself is $4.908 - 1 = 3.908$.

Then, since the equivalent orifices of the fan (A_f) and the mine (A_m) are inversely proportional to the square roots of the corresponding water gages, we have

$$\frac{A_f}{A_m} = \sqrt{\frac{1}{3.908}}$$

But, since $A_m = 24.8$ sq.ft., we find for the equivalent orifice of the fan

$$A_f = \frac{24.8}{\sqrt{3.908}} = 12.54\ sq.ft.$$

Ques.—What precautions would you suggest to protect workmen while timbering a shaft?

Ans.—Fence around the head of the shaft to guard against material falling into the shaft. Employ only experienced men and let the work commence from the top and proceed downward. Install a reliable signal system and employ a careful hoisting engineer.

Ques.—What is the difference between carboniferous, carbonaceous and bituminous shale?

Ans.—"Carboniferous" and "carbonaceous" are practically synonymous terms, describing the shale as containing more or less carbon. A bituminous shale is one impregnated with tarry matter, or bitumen, which is a hydrocarbon associated with the coal formations.

Coal and Coke News

Washington, D. C.

What is believed by many coal men to be a fair estimate of the injury done by the Secretary of War in his criticism of the price-fixing conference was voiced by C. L. Watkins at the meeting last week of the smokeless operators. Mr. Watkins' remarks as taken by the official stenographer, are as follows:

I would suggest that we have now in Washington an official or semi-official body known as the Committee on Coal Production, who were ostensibly appointed for the purpose of advising the Government in the present crisis. I would suggest that the whole matter of distribution of coal, selection of committees and agencies for carrying on this matter, and so forth, be left to the Committee on Coal Production. They have already had two or three months' experience in these matters; and in selecting a new man you may encounter delay in educating him for the job.

I want to endorse the sentiment that there is not a question, not the shadow of a doubt in the minds of the coal men as to their duty, their obligation, their privilege of furnishing to this Government the coal it needs, when it needs it; and that they are here for the purpose of coöperating with the Government. I don't want, as one individual, to utter a discordant note, but I do feel that it is fair to the Government, to the Committee on Coal Production, and to the operators here—and I would be delighted to say this to Mr. Daniels or Mr. Baker, and not in anything but a friendly and helpful spirit—I think it is but right to say that you came here in an emergency, called by the Peabody Committee, having an opportunity, for the first time in our history as coal men to meet at the request of the Government without fear of going to jail, for discussing pertinent things in connection with the coal industry. The magnificent challenge of Mr. Lane, the addresses by Governor Fort, and other representatives of the Government and by Mr. Peabody, met a response that was overwhelming in its effect. The operators wanted an opportunity to coöperate. We were sending our own boys to the front. We met all of the suggestions that were made. And what was the result? Unfortunately, perhaps through some misapprehension of the facts concerning what had been done, the statement was made a few days later that our action was extortionate, oppressive, and unjust.

Now, gentlemen, I think that was unfair, and that it could only have been done through ignorance of the facts. The word "slacker" was used. For the first time since the war began, three years ago, I felt myself almost a slacker. My own boy was at the front long before this country entered the war. I never thought I had been remiss in the performance of my duty.

We came here three weeks ago in the same spirit as today. The effect of that statement, I want to say, was chilling. The statement went out broadcast. It indicated a complete failure to understand that spirit and the spirit that has brought us here today. I want to do my part to restore that spirit, which is not so much in evidence today. I don't want to be a slacker. But if I find advisors of the President giving him unsound advice, I feel it my duty as a citizen—not as a coal man, but as a citizen—to say to him that that advisor is wrong. This war cannot be successfully prosecuted without both arms of this nation being free. You cannot tie the arms of the business men of this country without hindering the conduct of this war, without prolonging this war. There is a misunderstanding I want to correct. I am told by a member of the committee from New England now in this city, that they were told by one of the most prominent Senators that the Food Bill is going to pass, and it provides that no one in any industry can act in any but an advisory capacity. Are we to be thrown into the discard when we want to help? God knows there isn't a man here who will submit to be so treated without protest. This industry has already been thrown into a chaotic condition by ill-advised legislation. Prices have been extortionate in some instances, it is true. But every man in the business, every man that expected to be in the business, was just as much concerned with these extortionate prices as any Congressman could be.

And I say that in order to do our bit, to do what every one of us wants to do, we must get somewhere now. We have lost almost two weeks because of the chill. Let us have an opportunity to coöperate. The Peabody Committee brought us together in Washington some time ago to speed up production, create a pooling arrangement, etc. That was a tremendous thing. We men in the east are the men that have to supply the ships. We want to do it. Everything we can do we will do to speed up production. Profits? No. Business? Yes. Something to get the laboring men waked up—that is what we want. In order to do that we have to make living and economic conditions better than they have been. In respect to that, I am with the Federal Trade Commission. We know there is a great burden of taxes. We want to hope to be able to meet those taxes. The economic credit of this country, however, must be maintained; and we have to make the economic conditions of the men who dig this coal better. These men, many of them, have living conditions unfit to bring up a family in.

All these are things that must be recognized, that must be dealt with. But who is going to do it? Are we to be thrown into the discard, to be called robbers, pirates, etc., because there are a few of us who have taken advantage of the situation? This has been the first opportunity we have had to get together since the Sherman law was enacted. Aren't we to make anything of this opportunity? Aren't we to be allowed to make anything of it?

I didn't expect to say so much, but my heart is full of this situation. I want to make this plea now: For heavens' sake, don't disregard the advice, don't discredit the honesty and the patriotism of all these able and experienced men who want to do their part.

Coal mines in Illinois and in Indiana have shown increases over 1916 in each of the first five months of 1917, according to figures just compiled by C. E. Lesher, in charge of coal statistics for the U. S. Geological Survey. In March of this year, the production in these states showed an increase of 17.3 per cent. over March of 1916. In April of this year, the increase was 120 per cent. over that of April of last year. The May figures show an increase of 93.3 per cent., while in June the increase was 83.4 per cent. over that of June of last year.

The average value at the mines of all the coal produced in Illinois was 13.6 per cent. greater in 1916 than in 1915. In Indiana the average value was 15.5 per cent. higher in 1916 than in 1915. These figures include the coal used for mine fuel, sold locally and that used by employees.

These figures illustrate that when the value of all coal mined and sold during the year is taken into consideration, the returns to the operators are by no means commensurate with the high spot prices that may prevail.

After having surmounted numerous difficulties the Geological Survey issued the first of its weekly coal reports Saturday. The report shows not only the tonnage produced but the reason why the mines are not doing more. The report shows that the weekly output of the mines of the whole country was not less than 2,000,000 tons below full-time capacity. "By far the greatest factor concerned in the losses was the inadequate car supply," says the report. "Thirty-one per cent. of the total of the full-time capacity of these representative mines was lost because the supply of cars at the mine mouth was insufficient. Other important causes were labor deficiency, crippling the industry to 4.5 per cent. of its full-time capacity; mechanical breakdowns within the mines to which losses amounting to 3.2 per cent. were attributed. No loss was attributed to lack of market.

In submitting this first weekly report to Secretary Lane and the Coal Committee, Director Smith of the Geological Survey states that what has been accomplished in the six weeks since this statistical effort was begun, is largely due to the patriotic and prompt coöperation offered by the coal-trade associations' secretaries and the operators, whether members or nonmembers of associations. These figures from all sources are reduced to a comparable basis by a force of statisticians under C. E. Lesher, of the Geological Survey, with the immediate purpose of showing what factors in each district are limiting production and shipments.

With this information before it, the Committee on Coal Production is able to concentrate its efforts where the greatest stringency lies—whether, as in most localities, the trouble is lack of cars, or whether it is labor shortage. The operators, realizing that their interest lies in having this information promptly available, their support of this work, although it involves additional labor on their part, has been prompt and hearty. The first figures available give comparison of the first week of July with two weeks of June and are those furnished by the already organized trade organizations, which represent about 25 per cent. of the production of the country. Some of the important producing districts, particularly Alabama, West Virginia, parts of Pennsylvania, Ohio, and the territory from Texas to Iowa, figures from which are not shown in this first statement, are being rapidly organized for this purpose and have already furnished partial information. The weekly reports that will follow hereafter will include successively greater tonnage and be more representative of the total.

The districts covered by this statement are distributed over a large producing area and are indicative of what is happening in the coal-mining industry. A more general idea of the total production, but without indication of the causes of the loss of working time at the mines, will be found in the monthly bulletins issued by the Geological Survey, which are based on the daily, weekly, and monthly reports furnished by railroads originating more than 85 per cent. of the coal production of the United States. These bulletins are in no way supplanted by the weekly studies of the particular causes hampering greater output at the mines.

Apportionment of the coal needed by the Government will be undertaken by the State Committees of Seven, who have been asked to come to Washington on July 25. In his messages to the state committees, Mr. Peabody said in part:

"The meeting of all of the members of the various Committees of Seven from each state is to arrange an equitable distribution of this tonnage. Every operator in all of the states from which government coal will be shipped must take on his share. We will have figures on tonnage and quality required from each state.

"I trust you will come prepared to help this committee work out this problem at once, as the Government must have its coal and is desirous of making the distribution as equitably as possible."

While the committees will arrange an equitable distribution of the tonnage, allottments and adjustments will be made in accordance with the resolutions passed last week by the cabinet officers who are members of the Council of National Defense or "such agency or agencies as may be designated by lawful authority."

Operation of the pooling arrangement, which has been in effect since July 16 on the Baltimore & Ohio and the Western Maryland piers at Baltimore, is proceeding without a hitch, it is reported at the Tidewater Coal Exchange. The pooling will begin at the Baltimore & Ohio pier at St. George, Staten Island, July 23. The plan will go into effect generally at New York, Philadelphia, Baltimore and Norfolk on Aug. 1.

The Exchange has issued three classifications which give the pool numbers for each mine. The mines are grouped alphabetically according to name but the operator, his address, the region in which the mine is located and the railroad serving it also are given.

HARRISBURG, PENN.

In a statement issued by James E. Roderick, chief of the department of mines, he says that fatalities in the coal mines of Pennsylvania for the first six months of this year show a decrease of 22 over the same period for 1916.

The figures for the first half of 1916 show that 531 mine workers lost their lives, 241 in the bituminous region and 290 in the anthracite field. The first six months of this year show that 509 miners were killed, 230 in the soft coal field and 279 in the hard coal district, or a decrease of 11 for each district over that of 1916.

In the bituminous region for the first half of 1917, there were 213 lives lost inside the mines, while last year there were 228, a decrease of 15 over last year's figures for the same period. For the same number of months, 13 were killed outside of the mines during 1916 against 17 for this year, or an increase of 4, making a net decrease of 11 for the region.

In the anthracite region for the above periods, the figures are given as 236 lives lost inside the mines, as against 255 for 1916, a decrease of 19 over last year. Outside the mines there were 43 mine workers killed this year and 35 in 1916, an increase of 8 over last year, or a net decrease for the hard coal field of 11.

The increase in the number of lives lost outside the mines over 1916 in this region, was due to the big increase in accidents by machinery, which were 9, and electricity 3.

The chief of the department of mines, states that every effort is being made to maintain this good record for the balance of the year.

Senate Bill No. 622, which was said to be backed by the coal interests of the state, and which provided for a quadrennial assessment instead of a triennial assessment, gets the ax for the following reasons as stated by the Governor: "I am in favor of annual assessments. To anyone conversant with the rapid rise in values in certain parts of this commonwealth, it is manifest that an assessment that holds for four years would work a great injustice to the people at large and great advantage to the owning corporations, companies and individuals. An assessment is made say in 1916. Soon a great industrial boom comes along. New towns spring up. Roads and streets must be built, new schoolhouses erected, light and power secured, police systems enlarged, and in general, suddenly a whole new series of expenses clamor for attention. The community is helpless. The old assessment holds, as in this bill, for four years. The new community has no streets, no water, no light, no schools. The money rightfully available upon the increased value of realty in the community is denied. A new assessment cannot be had for four years. The people suffer. The owners of the property grow rich. It is unfair, unjust and undemocratic."

The Governor also vetoed the retirement bill as introduced by Representative Scott, who is a prominent Clearfield operator. This bill provided for the retirement of bituminous inspectors after serving the state in continuous employment for 30 years.

The Donnelly bill providing for motor ambulances in the anthracite region was approved by Governor Brumbaugh on July 19 and will go into effect 90 days after the date of signature. This bill provides that anthracite operators shall supply motor ambulances at every mine unless two or more collieries are located within four miles of each motor ambulance, when one ambulance will serve for all the collieries within this radius.

The state is to furnish free of charge a registration certificate and two number tags for each ambulance.

The Buffalo, Rochester & Pittsburgh R.R. has stopped the "wagon loading" of coal for the present at least. Orders have been issued to superintendents of the various divisions, instructing them to place no more cars at this time at sidings where coal has to be loaded from wagons. When the order went into effect it caused widespread consternation among the wagon loaders in the northern section of the state.

The Hocking Valley R.R. has placed a permanent order in effect barring wagon loading, and it is understood that several other roads contemplate a similar move. The order, it is said, is not a permanent one, but is liable to become so. It is stated that the commission at Washington is now considering the complete abolishment of loading coal from wagons, and it may be that before the Buffalo, Rochester & Pittsburgh order is rescinded, or in effect many days, a national order prohibiting wagon loading on all railroads will be issued.

Placing a car on a siding for wagon loading ties up the car from one and a half to five days, and railroad men claim that this is a great hindrance to the moving of traffic. Cars are badly needed, and it is probable that refusing cars to wagon loaders will help out the car situation.

The boom in coal prices opened many new mines in the bituminous region and the order of the railroads will result in a great hardship for many coal operators. It is said that where coal is loaded by tipple there will be an increased production, because more cars can be secured.

However, some arrangements were made at a meeting of the thin-seam coal operators at Butler on May 17, to form a permanent organization of thin seam operators of the western part of the state to send representatives to Washington to present their case to the government officials. John C. Graham was chosen president. At a later meeting thin-seam operators of Armstrong and Clarion counties will be invited to attend. There are about 200 operators of thin-seam coal in the northwestern part of the state, and they have expended more than $1,000,000 opening and equipping mines, many of them small, supplying country trade, but if prices should be fixed at less than $3 they would be put out of business. They claim the cost of putting coal on the tipples is about $2.50 a ton and they desire to get a net profit of at least 50 cents per ton.

The Tidewater Coal Commission authorized by the council of national defense has established offices in Philadelphia with Harry Bolton as deputy commissioner, Mr. Bolton is vice president of the Bituminous Coal Operators' Association of Central Pennsylvania.

The coal production committee of the national defense committee adopted a plan to pool shipments at four tidewater points to prevent the detention of cars. It is estimated that 36,000,000 tons of bituminous coal will be distributed at the four points in a year. These points are: Hampton Roads, Baltimore, New York and Philadelphia.

The Philadelphia piers on which the pooling of coal will take place, effective Aug. 1, are the Port Richmond, Greenwich and Jackson Street piers. This announcement was made on July 19 by the Tidewater Coal Exchange, which is coöperating with the Railroad War Board and the Coal Production Commission.

All coal for export and much of that for use around Philadelphia will be pooled in this manner. Coal of all kinds will be run on particular tracks. Each shipper will keep a credit and debit balance with the deputy commissioner of the Tidewater Exchange.

The Susquehanna Coal Co., long owned by the Pennsylvania Railroad Co., has been sold to M. A. Hanna & Co., of Cleveland, known as one of the largest soft coal and ore interests in the country. In the same deal went all other anthracite mining properties owned by the road. The sale was announced on July 19. The price has not been disclosed.

The sale of the Susquehanna coal properties brings to a culmination efforts of the Pennsylvania Railroad Co., which began more than three years ago, to conform to the commodities clause of the Hepburn law. This law prohibits any railroad from carrying in interstate comerce a commodity in which it has an interest. The law, which was framed in 1906 and upheld by the Supreme Court in 1913, set in motion a number of prospective deals by which the railroad company endeavored to rid itself of all anthracite holdings.

Compliance with this law forced a number of so-called "coal roads" to part ownership with their coal properties through the formation of separate corporations to control the coal after it left the mines. Among these were included the Lehigh Valley R.R. (whose coal distribution is now conducted through the Lehigh Valley Coal Sales Co.), the Erie and the Delaware, Lackawanna & Western.

The Pennsylvania Railroad Co. decided to dispose entirely of its coal properties. The Susquehanna long was known as a poor financial relation and numerous deals grew and faded unsuccessfully. Most of the mines are situated directly on the lines of the Pennsylvania, and prospective purchasers, most of whom were railroad companies, did not relish the idea of holding a property located on a competing line. Within the last year the Pennsylvania was reported at different times to have sold the Susquehanna property to the Lehigh Valley Coal Co., Lehigh Coal and Navigation Co., and the Delaware & Hudson Co. The property was rumored to go to the Lehigh Coal and Navigation Co. in payment for the Lehigh & New England R.R. of which the larger road was trying to gain possession. For several months, and until recently, it was generally believed the Delaware & Hudson would take it any day.

The firm of M. A. Hanna & Co. is best known as agents of the Hill interests. It acts as selling agent for the Great Northern Ore Co., which the United States Steel Corporation leased and then dropped on threat of suit by the Government. The Hanna company was started by the late Senator Mark A. Hanna. It is one of the big factors in the Ohio and Pennsylvania bituminous fields, but so far as is known the purchase of the Susquehanna and its allied properties is its first attempt to get into the anthracite field.

It is understood the coal will be sold in western markets and the Pennsylvania will get the traffic.

The Susquehanna Coal Co. owns 26,938 acres, with an annual output of almost 5,000,000 tons and total sales of nearly 7,000,000 tons, the difference representing coal purchased from other mines.

The Susquehanna Coal Co. was organized and incorporated in 1867 for the purpose of mining hard coal. The properties comprise coal lands in lower Luzerne, Schuylkill, Dauphin and Northumberland counties. Morris Williams, its president, has headquarters, in Philadelphia, and the operating headquarters are in Wilkes-Barre, where Roberts A. Quin is general manager.

The company's property in Luzerne County is located in Nanticoke, where it has three collieries, and runs the coal of the West Nanticoke Coal Co. through its breakers. The bulk of the property, however, is in Schuylkill, Dauphin and Northumberland counties. The Schuylkill properties are in the neighborhood of Shenandoah and Minersville; the Dauphin properties are in the Lykens Valley, and the Northumberland County properties form a ten-mile strip from Mount Carmel to beyond Shamokin, and include seven great producers.

PENNSYLVANIA

Anthracite

Taylor—The Holden breaker of the Delaware, Lackawanna & Western Railroad Co. has been abandoned after 32 years of service. The coal from the Holden mine will in future be run through the Taylor breaker for preparation. The Holden output is about 600 tons daily and its abandonment will affect a number of men and boys employed outside. The inside employees will not be affected in the least.

Hazleton—Official announcement was made here on July 20, by the Lehigh Valley Coal Co., that plans have been abandoned for the construction of a mammoth tunnel from Hazleton to Butler Valley until after the war, owing to the shortage of labor and the high price of materials. The tunnel, which was mapped out two years ago, is eventually to drain the operations in the Hazleton basin, saving $500,000 annually now spent for pumping water out of the slopes. It is laid out on lines similar to the tunnel that carries the water from the workings of the G. B. Markle company from Jeddo and vicinity to the Nescopeck Creek in Butler Valley and thence to the Susquehanna River. The Nescopeck Creek will be the outlet of the valley tunnel also.

Wilkes-Barre—Officials of the Lehigh Valley Coal Co., have decided to hold no first-aid contest this year. This is being done in order to keep the mines working every day, in the hope of speeding up the production for war purposes. It required four days last year to hold the contests in the four divisions operated by the Valley company.

Shamokin—James Brothers, operators of the Colbert colliery, made an offer to their employees on July 21, deciding to present a $50 Liberty bond to each miner who agrees to work a full eight-hour day. Many miners go home after working five or six hours and this reduces the output of the colliery. It is the aim of the owners to have every man work full eight hours each day and thus increase the output to its maximum, in keeping with the request of the Government.

Bituminous

Pancoast—A new mine is being opened here, the company opening it having leased the coal rights on a 100-acre tract. The drift has been opened for about 100 ft. and a fine 38-in. bed of good coal is now open for mining. In addition it is believed that there is a good-sized body of 5 or 6 ft. coal above the bed now being worked.

A tipple and incline will probably be built in the near future, but in order to take advantage of present high prices, wagons are being used to get the coal down to the railroad which is close to the mine.

Indiana—Isaac Smith and associates of this city have purchased several hundred acres of coal lands from the Wherle interests near Black Lick, Indiana County. This land was recently drilled and found to contain three good beds of coal. Several large transactions have taken place since the drilling of the valley. The Smith's will open the new tract at once and plans are now under way for the construction of a new mining town near Josephine.

Pittsburgh—One of the largest projects in the line of modern housing yet undertaken in the vicinity of Pittsburgh has just been started and means the establishment of a model mining town about two miles back of Harmsville by the Inland Collieries Co. The new town is to be known as Indianola, and will have improved streets, sewers, gas and water, together with churches. stores, a school and 200 model houses to start. The town has been laid out with a view to future growth, and the entire contract for it and all buildings has been let to the Thompson-Starrett Co. It is to cost nearly $700,000.

Kent—The Coal Run Mining Co. awarded a contract to the Hyde-Murphy company of Ridgeway, Penn., recently for the erection of several double miners' dwellings at its plant near here. The Coal Run company has installed two new electrical fans and is erecting a large sub-station to care for the opening of four new mines. Two new tipples will also be erected.

Mosgrove—Several Punxutawney capitalists are interested in the opening of a large new coal tract near here. Drifts are in and other improvements to the property are fast rounding into shape. Switch connection will be made with the Pittsburgh & Shawmut R.R.

Uniontown—The Prospect Coal Co. has completed its sidings and tipple and is now shipping coal from its new operations on the Mathiot farm near Smithfield. The company recently purchased the coke ovens formerly used by the Acme company and will coke a large portion of its production.

Work has been started on building the trestle dock for the H. C. Frick Coke Co., at Adah, above Lock No. 6, on the Monongahela River. This work is being prosecuted by the Foundation Co. of America, the contract price being reported at $250,000.

The properties of J. V. Thompson in the vicinity of Uniontown will be inspected shortly by Louis Hill, Watson P. Davidson, and James F. Sperry, of St. Paul, and Samuel L. Thrope, of Minneapolis. Several legal representatives of the Hill interests have been in Uniontown for some time in connection with this inspection.

McGrees—The Cortez Coal Mining Co. of Punxutawney is opening a new mine near here. The drifts are in and buildings almost completed. The tipple will be erected on the old stone quarry siding and shipments made over the Pennsylvaia R.R. Rodger Hampson, former state mine inspector is president of the company.

WEST VIRGINIA

Fairmont—Announcement was recently made of the opening of offices in the Jacobs Bldg. for the Crescent Fuel Co., which firm has begun operation and has contracts for the output of several mines. R. A. Johnston, who has been for a number of years the traffic manager of the Hutchinson Coal Co., is sales manager of the new firm. This company has a number of mines in operation and others will be opened within a few months.

Charleston—Owing to the exceedingly high wages being paid employees in the coal industry in West Virginia, young men are abandoning other pursuits and professions for coal digging, at which more money can be made. College men are not infrequently found working side by side with coal miners of the old school, while school teachers are resigning their positions to take up the pick and shovel. As an example, J. R. Downs, a student at the West Virginia University at Morgantown, recently dug 115 cars of coal by pick work during two weeks, and received $140.70 for his work. Mr. Downs is working at Rock Forge, near Morgantown.

Clarksburg—The Ross F. Stout & Bros. Co. is installing equipment for a capacity of about 500 tons daily. Preliminary to this output, it has about 10,000 tons stored, which will be loaded in railroad cars from wagons at the rate of about one car per day. The development is in the Pittsburgh Vein, known as Fairmont gas coal.

Glendale—The Richmond Coal Co. has, during the past few days, been having coal shipped to the mine and dumped from the hopper cars into small mine cars, which are then discharged into the coal bin at the mine from which Baltimore & Ohio locomotives fill their tenders. This mine has been idle for some time on account of labor difficulty. About 20 men are now at work at the mine, it is stated.

ALABAMA

Birmingham—The Semi-annal examination of applicants for positions as mine foremen and firebosses in Alabama coal mines, usually held in July, has been indefinitely postponed, according to announcement given out by Chief Mine Inspector C. H. Nesbitt.

Coal mining activities are on the increase in the Walker County field and a number of new mines are being developed. The Borden Coal Co. has leased 160 acres of coal lands near Cordova and it is understood will make extensive developments. Near the Borden company property Monroe Aaron has resumed the operation of an old opening. J. S. Freeman and associates are reopening the Norvell mine near Jasper. It is announced that Cain O'Rear has purchased 300 acres of coal lands near Drifton, where the O'Rear Coal Co. now operates several openings, and will develop the new property.

KENTUCKY

Greenville—The W. G. Duncan Coal Co. has let a contract for erection of an office building to cost $20,000. It will be an ornamental structure, 55 x 65 ft., one story in height and fireproof.

OHIO

Athens—The coal properties of the Luhrig Coal Co. have been sold by the sheriff at auction, the purchaser being Charles H. Deppe, a Cincinnati banker, who paid $51,000 for them, on behalf of creditors. The mines were appraised at $34,900, and there was lively bidding for the properties. They have not been operated for some time, but it is understood that the mine now on the property will be placed in commission again, and possibly other mines opened. About 3500 acres of land are included in the deal.

Columbus—Ohio authorities have been actively engaged in investigating the coal situation and in framing measures to meet it. The latest suggestion is coöperative action by the state authorities of Ohio, West Virginia, Indiana, Pennsylvania, Illinois and Kentucky, for the purpose of regulating the coal situation, and the authorities in these several states have been asked to indicate their opinion of the possibility of joint action for this purpose. Ohio operators have indicated their willingness to accept price regulation, but ask that they be assured of a fixed price at the mines, in order to avoid the complications incident to transportation and dealings with middlemen.

INDIANA

Indianapolis—Charges that enemy influences are at work to curtail the production of coal in Indiana, and an appeal to both operators and miners of the state to combat this influence, were recently made in a formal statement by the State Council of Defense. Definite information as to the nature of the alleged enemy influence was lacking, but it is said that the charges in no way reflect on union organizations, the influence having been brought to bear on individuals and groups of miners.

Bicknell—The rescue squad, organized some time ago by the Knox County Coal Operators' Association to be employed in case of mine accidents, has been equipped with a rescue and recovery outfit at an expense of about $3000. This squad is composed of 13 men, picked from various mines, and is under the leadership of Walter Scott, an expert English miner. A car is being constructed for mine-rescue purposes. In case of accident this will be promptly moved to the scene of such disaster. The rescue squad has been twice employed in such instances already.

ILLINOIS

Gillespie—Mines No. 2 and 3 of the Superior Coal Co. here broke the output record of the state for the fiscal year ending June 30, according to figures made public by John P. Reese, vice president and general manager of the company. Mine No. 2 produced 1,071,284 tons, operating 249 days and 3 hours, and Mine No. 3 produced 1,158,797 tons in 260 days, 1 hour and 30 minutes, a total for the two mines of 2,230,081 tons. Mine No. 1 of the same company produced 885,467 tons in 237 days and 6 hours.

Moxahala—A small portion of the Toledo & Ohio Central tunnel near this place fell in last week, holding up traffic for about four hours. All of the mines on this road were shut down for one day as a result of the disaster.

Pittsburg—C. A. Gent of Chicago is sinking a shaft on the Singler farm and the new property will be known as that of the Crab Orchard Coal Co.

Harrisburg—Something unusual in the suothern Illinois coal fields is the average payroll of the mines in the Harrisburg district, which average $277,700 every two weeks. The daily tonnage of coal produced in the Harrisburg district is 20,000, and the average daily shipment is 450 cars. The mines in Saline County are now short 3000 men

Blue Mound—J. M. Corsein of Stonington, Ill., has purchased the Blue Mound mine, which has been closed four years, and will open it as soon as it has been made ready. One hundred and fifty men will be employed.

Johnston City—Work has begun upon the sinking for the new mine of the Johnston City Coal Co., which will be located a couple of miles north of its present mine at this place. It is expected to be one of the 'argest mines in Williamson County.

Marion—The Vulcan Coal Co. incorporated here with a capital of $50,000, is rapidly putting into shape a large strip mine northwest of here and also driving a drift mine near the old Watson No. 1 mine.

Personals

George H. Grone has been appointed Philadelphia manager for the Cochran Coal Co., with offices in the Widener Building.

Hugh Drummond, for several years manager of the Huber Hotel at Middlesboro, Ky., has resigned and has accepted the position of general manager of the Crystal Coal Co., at Logmont, Ky.

A. C. Peterson has been appointed to the sales force of the Mount Hope Coal Co., with offices in the Harrison Building, Philadelphia, Penn. He was formerly connected with Madeira-Hill and Co.

P. W. Ott, of Butler, Penn., a mine inspector has been added to the staff of the State Workmen's Insurance Fund, which has offices in the Suppes Building at Johnstown. There are now seven inspectors on the bituminous staff.

Oscar North, who has been manager of several company stores controlled by the Rochester & Pittsburgh Coal and Iron Co., has resigned to accept a similar position with the stores of the Davis Coal and Coke Co. at Thomas, W. Va.

Sumner S. Smith, inspector for the Federal bureau of mines has been placed in charge of the development work at the Eska Creek coal mines near Seward, Alaska, recently purchased by the Alaskan Engineering Commission.

George Watkin Evans of Seattle, Wash., has been delegated by the Alaskan Engineering Commission to purchase the equipment for developing coal mines to be operated by the Government in the Matanuska coal fields of Alaska.

Prof. Frank A. Ray, prominent consulting mining engineer of Columbus, Ohio, and Professor of Mining Engineering at the Ohio State University, and who has been in Russia for the past nine months examining and reporting on coal mines and lands for banking interests, has just returned home.

H. C. Cappel, who has been employed in the Auditing Department of the Elkins Coal and Coke Co. for the past ten years, will shortly sever his connection with that firm to accept a position at the new steel plant, now being built by H. C. Greer and others, at Canal Dover, Ohio.

Thomas Henderson has retired from the Coxe Traveling Grate Co., to become chief engineer for the Benjamin Iron and Steel Co. of Hazleton, Penn., whose business is being expanded on account of increased demands in the repair and construction of mining and breaker equipment.

W. L. Kluttz, has resigned his position as general manager of furnaces and coal mines of the Central Coal and Iron Co. and accepted a like position with the Sheffield Coal and Iron Co. and will be in charge of the work of placing its properties in shape for resuming operations.

Sheldon Smiley has been promoted from assistant chief engineer to chief engineer of the Rochester & Pittsburgh Coal and Iron Co. and the Jefferson & Clearfield Coal and Iron Co. vice George W. Brymer who re-

signed recently to accept a position with the Deleware and Hudson Co. at Scranton, Penn. Mr. Smiley will be located in Indiana, Penn.

David C. Bottling, secretary of the Washington Coal Operators Association, Seattle, recently passed highest in a state examination for the position of coal mine inspector. He does not intend to accept the position having taken the examination to satisfy himself that he knew the needs of the work. James Bagley passed second highest and will likely receive the appointment.

J. M. Roan, chairman of the Ohio Coal Commission has taken steps to insure a sufficient coal supply for threshing purposes in the rural communities of the state. To that end he has sent out letters broadcast asking communities to ascertain if there is a sufficient coal supply for threshing and if not to state the number of tons deficiency. This is to insure the threshing of the bumper wheat crop.

Obituary

Dennis H. Sullivan, one of the best known miners in Ohio died at his late home, in Coshocton, Ohio, recently after a short illness. He was president of the Ohio district, United Mine Workers of America for a number of years. Later he was appointed on the state board of arbitration by Governor Harmon and still later was named a deputy mine inspector by Governor Cox. He was well known because of his success in settling labor difficulties between miners and operators.

Industrial News

Philadelphia, Penn.—It is reported from the Pennsylvania R.R. headquarters here that fuel will cost that road $24,000,000 more in 1917 than it did in 1916.

Washington, D. C.—Reports to the Railroad War Board show that in June the country's railroads moved 750,323 cars of bituminous coal. This is an increase of 26 per cent. over the coal movement for June of last year.

Halifax, N. S.—Sixty-two men were reported killed July 25 in an explosion at No. 6 mine of the Dominion Coal Co. at New Waterford, C. B., according to advices received here from Sydney. Twelve bodies had been recovered at noon.

Sunnyside, Wash.—A discovery of coal has been made on the Lozier homestead in the Rattlesnake Hills north of this place by Earl Rowland and others. Samples have been forwarded to Portland to ascertain the commercial value of the coal.

St. Louis, Mo.—Attorney-General McAllister announces that an investigation will be made through his office, of increases in the price of coal in Missouri. Prices, he says, have advanced from $2 to $5 a ton, which he thinks is not justified by the increases at the mines.

Youngstown, Ohio—The installation of the new byproduct coke plant at the Brier Hill Steel Co. here has been completed and instead of the coke for the companies use coming from the Brier Hill Coke Co.'s plant in Pennsylvania, it will be manufactured at Youngstown. The output of the Brier Hill Coke Co. is thus thrown on the open market.

Springfield, Ill.—W. O. Nesbit, secretary-treasurer of the United Mine Workers of Illinois, has filed suit here to foreclose the mortgage held by the mine workers' organization on the Vogel estate at East St. Louis, on which the organization loaned $100,000. It is alleged that interest notes are overdue and no part of the principal has been paid.

Seattle, Wash.—Bids opened by the Northern Bank and Trust Co. for the purchase of the Issaquah & Superior Coal Co. preperty included those of Frank Waterhouse & Co. for $266,000 and the American Bank and Trust Co. for $256,000. It is probable that the property will be sold at public auction and both the proposals so far received rejected.

Seattle, Wash.—Railroads operating in the State of Washington will ask the Public Service Commission at once for permission to increase coal freight rates 15c. per ton, and hope to secure a hearing without filing elaborate tariff schedules. It is expected that the increase will be granted as a part of the precedent established by the Interstate Commerce Commission.

Paducah, Ky.—The Paducah Board of Trade, which some time ago obtained an order from the Kentucky Railroad Commission reducing the rate on steam coal to that city, has now applied for a reduction in the rate on domestic sizes. It is contended that the city is being discriminated against, as in the case of Louisville. A reduction from 90c. to 80c. is asked for on the ton.

Hazleton, Penn.—Charles P. Neill, umpire of the Anthracite Conciliation Board, has handed down a ruling in the case of miners at the Locust Spring and Locust Gap Collieries of the Philadelphia & Reading Coal and Iron Co., holding that the operators in the field are not required under agreements with the men, to file wage sheets covering the 1916 rates, in addition to those of 1902 and 1912.

Lewistown, Mont.—The Republic Coal Co., a subsidiary of the Chicago, Milwaukee & St. Paul Ry. has paid the Government, through the U. S. Land Office here, $34,419 for the underground rights to 669 acres of coal land southeast of Roundup and near Klein, Mont. The company's mines are located at the latter place. More than $9000 was spent by the company in prospecting the land it has just acquired control of.

Hazleton, Penn.—Barrett & Haentjens have combined their business with the Benjamin Steel and Iron Co., in the manufacture of a number of patented articles. The Benjamin company is erecting large new shops at which mining and steam shovel machinery is to be turned out. The company is a subsidiary of the Pennsylvania Stripping and Quarrying Co., which operates a dozen coal strippings in the Lehigh field.

Columbus, Ohio—The news that Ohio operators will be asked to furnish their proportion of 4,000,000 tons of Government fuel has caused considerable surprise among Buckeye operators. Ohio operators wondered where their coal would be used and have been informed that it would be shipped to Government buildings and other inland Government work, thus saving Pocahontas, New River and other coals for bunker purposes.

Altona, Penn.—The courts on July 18, granted Thomas N. Miller, superintendent and chief engineer of the Altoona Northern R.R. and the Blair-Cambria Coal Co., a preliminary injunction restraining the officials of the corporations from ousting him from his position. Miller contends he was under a year's contract, beginning Jan. 1, of this year, at $3000 a year. He asserts that the work was satisfactory and that there was not just cause for his being summarily dismissed.

Cincinnati, Ohio—The receivership of the greater part of the lines included in the Cincinnati, Hamilton & Dayton R.R. system has been terminated by Receivers Judson Harmon and Rufus B. Smith, and they have formally delivered to the Baltimore & Ohio Railroad Co. possession of the property in their possession, excepting the lines from Dayton to Delphos, Ohio, and from Berlin to Dean, Ohio. Notices have been sent out to all employees of the system to govern themselves accordingly.

Birmingham, Ala.—Announcement has been made by James Gayley, president of the Sheffield Coal and Iron Co., that its furnaces at Sheffield will be rehabilitated and placed in commission as early as possible. This plant has been idle for several years. It is further stated that the company will construct a byproduct coke oven plant adjacent to its furnaces. The company owns extensive coal properties in Walker County and has a number of old-style coke ovens which will be placed in operating condition.

St. Louis, Mo.—Coal freight rates to practically all points west of the Mississippi River were advanced 15c. a ton during the past week by the Interstate Commerce Commission, lifting the suspension which it had placed on the new schedules filed by the railroads. The roads had attempted to make the increase 15 per cent. After the suspension they agreed to make it 15c. a ton. The Illinois intrastate rate remains as it was, which makes it now 35c. a ton less than on interstate shipments, the bridge toll being 20c. a ton.

Boise, Ida.—Stockholders in the Teton Valley Coal Co. are subscribing to a fund to be used in sinking a shaft and installing a hoisting plant at its mine east of Driggs, Ida. The bed to be further developed is 5 ft. thick and has been operated through a shallow entry tunnel at a depth of 50 to 200 ft. on the dip of the vein which stands at an angle of 45 deg. This development has been carried along the bed for a distance of a mile and has produced over 20,000 tons of coal. The depth will be increased 500 ft. Engineers have estimated that there are 4,000,000 tons of bituminous coal within 500 ft. of the surface at the mine.

St. Louis, Mo.—Plans for the financing of a $2,000,000 barge line between St. Louis and New Orleans were advanced at a recent meeting of local shippers and business men at the Chamber of Commerce. The conference was held at the request of Walter Parker of New Orleans, special investigator of river traffic under Secretary Redfield. He reported that New Orleans had pledged $750,000 and expected St. Louis and Memphis to subscribe the balance. It is planned to have one of the members of President Wilson's cabinet at the next meeting. James E. Smith, president of the Mississipi Valley Waterways Association, just back from Washington, announces that the Government will build barges of navy steel and offer them for use in river transportation.

Ramey, Penn.—The verdict for $49,710.29 obtained by the Bulah Coal Co., operators of bituminous coal in Clearfield County, against the Pennsylvania R.R. for coal car discrimination, was sustained on July 19, by the United States Circuit Court of Appeals. The alleged discrimination for which the Bulah Coal Co. was awarded damages occurred between July 1, 1902, and June 30, 1907. In having its supply of coal cars curtailed while the Berwind White Coal Mining Co., and other favored companies in the Clearfield district were receiving their full quota, the Bulah company complained that it lost considerable profit on coal it was unable to ship, and because of insufficient transportation facilities it was compelled to shut down, with the result of its working forces being disorganized.

Columbus, Ohio—According to Commissioner W. D. McKinney of the Southern Ohio Coal Exchange, the mines of Ohio have shipped up to the middle of July, 3,000,000 more tons to Lake ports than for the same period last year. The pooling of shipments has been a success from the standpoint of the operators desiring this kind of business. The bulk of this tonnage is for distribution in Canada and points in Michigan, Wisconsin, Minnesota and the Dakotas. The securing of sufficient soft coal at upper ports depends now upon the boats, and efforts are being made to persuade steamship lines who now send ore boats up light to permit them to return with coal. An adequate supply of Ohio and West Virginia coals at the head of the Lakes will have a tendency to relieve the Indiana and Illinois mines and afford them the opportunity to care for their regular market which is sorely in need of all the coal that can be produced.

Columbus, Ohio—The Ohio Utilities Commission has postponed the new coal rate advance of 15c. on the ton, asked by railroads on all intrastate traffic until July 31, in order to give time for a thorough investigation of the subject. A hearing on the matter has been announced. Little opposition to the advance has developed because of the advance of 15 per cent. on all interstate rates, which maintains the desired differential between Ohio and West Virginia mining districts.

Seward, Alaska—A 4-ft. bed of coal, 8 ft. below the surface and only 30 ft. from the main line of the Government railroad, has been discovered at Mile 175, 16 miles nearer this place than the deposit which is being developed at Chickaloon.

The Eska Creek coal mine which has been operating for several months by private capital under the name of the Eska Creek Coal Co., has been taken over by the Alaskan Engineering Commission which will start extensive development work at once.

Columbus, Ohio—Protests from Washington against the order of the Hocking Valley Railway Co., refusing wagon mines the use of coal cars, have been the cause of a postponement of the date of effect of the order until July 31, it was announced recently. The railroad gave the order and started its enforcement in the interests of efficiency in car supply. But it was pointed out that wagon mine production might easily be a matter of interstate commerce and that some action should be taken by the Interstate Commerce Commission or other Federal agency. So the order was held in abeyance and application has been made for its enforcement. It is argued by railroad officials, especially by M. J. Caples, head of the Hocking Valley Railway Co., that cars used to load wagon mines could be much more efficiently used on other lines, in case the Hocking Valley Ry. has more cars than are necessary to take care of the tipple mines. It is claimed also that the miners employed in wagon mines could be used in producing two and three times the amount of coal in well equipped mines and by the operation of wagon mines the total production and distribution of fuel is curtailed.

Market Department

GENERAL REVIEW

Heavy anthracite shipments fail to relieve the tension in the hard-coal trade. Bituminous shipments confined largely to contracts. Strain on transportation facilities beginning to tell. Middle Western domestic consumers again in the market.

Anthracite—The persistent buying on the part of the public is evidence of their growing conviction that there will be a pronounced shortage of coal next winter. In the meantime the uncertainty is being greatly accentuated by the difficulty dealers are finding in explaining to their customers the apparent discrepancy between the extraordinary record-breaking shipments and the great shortage that prevails; if, as is generally stated, these shipments are being diverted to outlying points, the receipts in those sections are failing to show any results from this, and the Washington authorities could greatly relieve the existing tension by explaining away this puzzling situation. Certainly, the trade will be slow to accept the promises now being made of increased shipments later, under existing conditions. Premiums are freely offered for coal, but as a good many agencies are getting notices from Washington inquiring about excessive prices they are charging, they are very careful about considering any high-priced business.

Bituminous—Shipping offices are flooded with inquiries, and what spot business is being done is undoubtedly close to the Government maximum, but operators are concentrating shipments on contracts, the prices on which range at a higher level, or on export business, which has not yet been subjected to regulation. Car supply is short, and railroads have been so hard pressed for locomotive fuel that they have occasionally been compelled to confiscate shipments en route. The labor situation is growing constantly more acute; not only have considerable numbers of the men in the mines joined the colors, but the operators have for some time been feeling the loss of new increments which have been joining the army instead of entering the mines. There is so little encouraging in the existing situation, with stocks constantly disappearing faster than supplies arrive, that a consumer feels that he can make no mistake by taking up any free coal that offers.

Lake Trade—The strain on transportation facilities is beginning to tell and interest is centered on this phase of the situation. The larger buyers are becoming more concerned and the feeling is growing that a most serious condition is in prospect when the heavy crop movement gets under way and the railroads begin to seriously face the task of moving supplies for the draft armies soon to be called to the colors. On the other hand there is a notable tendency to proceed very cautiously because of the uncertainty as to what the Government officials will do; should further reductions in price be made buyers at current levels would be facing the prospect of finding themselves with considerable high-priced coal on hand The statement of the Governor of Ohio, advising purchasers that prices will be forced to still lower levels, has been a contributing factor in this connection Shipments to the upper Lake docks are in good volume,

Middle West—Domestic consumers are showing more interest in the market, with the result that a great many of the orders withdrawn over the past two or three weeks have again been placed with the operators, who are once more well filled up for some time ahead. The inadequate shipping conditions are being further emphasized by distinct indications of distress on the part of the railroads; an unusual number of embargoes have been placed during the past week, while the car shortage has become still more acute. The upper Lake docks are unable to accumulate any appreciable reserves, all arrivals going out immediately and dealers in the Northwest are becoming much concerned over the outlook. It is conservatively estimated that a minimum shipment of two million tons per month up the Lakes will be necessary to avoid a severe shortage.

A Year Ago—Anthracite in fair demand in all sections. Bituminous slightly stronger with prices firm and in some cases higher.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	July 28	July 21
Clearfields	$1.10@1.60	$3.64@4.50	$3.65@3.75
Cambrias and Somersets	1.35@1.75	3.64@4.75	3.65@3.75
Pocah. and New River[1]	† 2.90@3.00	5.14@6.60	5.10@5.20
Philadelphia			
Georges Creek (Big Vein)	1.90@2.00	3.25@3.75	6.00@6.25
W. Va. Freeport	1.25@1.30	3.25@3.75	5.25@5.50
Fairmont Gas mine-run	1.40@1.50	3.25@3.75	5.50@5.75
Pittsburgh (steam coal)[2]			
Mine-run	1.30@1.40	3.00@3.25	3.00@3.25
¾-in.	1.40@1.50	3.50@3.75	3.50@3.75
Slack	.80@ .90	3.00@3.25	3.00@3.25
Chicago (Williamson and Franklin Co.)[2]			
Lump	1.55@1.65	3.45@3.55	3.45@3.55
Mine-run	1.20@1.30	2.70@2.80	2.70@2.80
Screenings	† .95@1.05	2.70@2.80	2.70@2.80
Gross average[3]	$1.43@1.58	$3.39@3.88	$3.96@4.13

Gross Averages[3]	1917	1916
Mar. 17	4.80@5.19	1.46@1.65
Mar. 24	4.64@4.94	1.49@1.66
Mar. 31	4.20@4.44	1.46@1.61
Apr. 7	4.07@4.36	1.44@1.60
Apr. 14	4.01@4.35	1.45@1.61
Apr. 21	3.83@4.14	1.46@1.62
Apr. 28	3.81@4.12	1.45@1.62
May 5	4.04@4.40	1.45@1.59
May 12	4.64@4.98	1.44@1.59
May 19	5.08@5.54	1.42@1.56
May 26	5.10@5.58	1.41@1.55
June 2	5.00@5.46	1.47@1.63
June 9	4.80@5.24	1.52@1.72
June 16	4.77@5.23	1.50@1.66
June 23	4.81@5.15	1.51@1.67
June 30	4.79@5.15	1.46@1.64
July 7	3.88@4.35	1.41@1.57
July 14	3.95@4.12	1.41@1.57

[1] F. o. b. Norfolk and Newport News. [2] Per net ton. [3] The highest average price made last year was $4.80@5.33 made on Nov. 25. *Price lower than the week before. †Price higher than previous week.

GOVERNMENT MAXIMUM PRICES ON ANTHRACITE

The following are the gross selling prices on individual anthracite suggested by the Federal Trade Commission. The maximum for egg, stove, nut and pea may be considered a fair indication of the maximum mine prices of individual operators for sales to retailers involving domestic supply. For industrial business, prices on egg and pea may vary to some extent from the prices indicated:

	White Ash	Red Ash
Egg	$4.70@5.00	$5.20@5.50
Stove	4.95@5.25	5.45@5.75
Chestnut	5.05@5.35	5.55@5.85
Pea	4.25@4.55	4.50@4.80

COAL PRODUCTION

The following is the weekly report on the production of bituminous coal and the causes of losses of working time. Figures indicate that the bituminous mines of the country are working to 75 per cent. of their capacity. The ratio of tonnage produced to full-time capacity for the three weeks ending June 23, June 30, and July 7 for 12 operators associations reporting approximately one-fourth of the tonnage produced in the country are shown in the following table:

Per cent. of full-time output in week ending:

State	June 23	June 30	July 7
Indiana	68.3	69.5	73.0
Illinois	65.9	72.7	78.2
Ohio	70.5	65.5	76.3
Pennsylvania	75.5	72.3	75.4
Eastern Kentucky and Tennessee	63.2	72.8	75.0
United States*	72.9	71.4	76.5

*Embraces twelve associations with a combined production of about one-fourth of the production of the country.

Per cent. of full-time output lost on account of:

Week Ended	Car Shortage	Blocked Loads	Labor	Mine Delays
June 23	20.4	0.1	3.2	2.7
June 30	21.0	0.1	4.5	3.2
July 7	12.2	0.1	6.5	4.2

The increase in the percentage of full-time capacity produced from 71.4 for the week ending June 30 to 76.5 for the week ending July 7, is attributed to the fact that the mines were shut down on July 4, and the railroads were therefore able to supply more of the cars ordered for the remainder of the week. Actual tonnage losses, below full-time capacity, as reported by 6 associations representing approximately one-fifth of the production of the country are shown in the following table:

Week Ended	Full Capacity	Actual Production	Losses	% of full-time output Produced	Lost
June 23	2,059,327	1,495,272	564,055	72.5	27.5
June 30	2,175,287	1,516,267	659,020	69.7	30.3
July 7 (5 day week)	1,780,024	1,335,861	444,163	75.0	25.0

BUSINESS OPINIONS

Iron Age—Buyers of pig iron and of all forms of finished steel continue for the most part to hold aloof from the market, and their fear of what may happen to prices as the result of Government action is in sharp contrast with their willingness only lately to pay any price the producers might name. It is evident that finished steel in the hands of manufacturers and jobbers is of fair proportions, and the latter in particular are disposed to work down their stocks in the interval of waiting.

Dry Goods Economist—Interest of buyers in the market, and of merchants, now is centered upon the efforts of garment manufacturers to bring about the acceptance of net terms of delivery, instead of the discount terms which have prevailed for a number of years. The proposition of the manufacturers is opposed by retailers on the ground that no change in the terms of the sale of a line of goods should be made during the continuance of a season. For example, the retailers point out that considerable quantities of ready-to-wear garments had been purchased at established prices, less 10 per cent., in the expectation that such terms would prevail throughout the season.

Bradstreet—A broad survey of trade, crop and industrial conditions yields a preponderance of encouraging reports for a midsummer period, but particular aspects of the general situation reflect uncertainty over governmental price fixing, which has made for more or less conservatism as to future wants, and incidentally there are some readjustments of outputs in deference to the government's imperative needs, which continue the chief single factor.

Dun—Halting tendencies appear both in new business and in prices, and results mainly from continued doubts about prospective economic changes arising from war conditions. Hesitancy and waiting have become more general and pronounced in steel and iron, and nearly everywhere there is a growing disposition to defer important forward engagements pending more definite knowledge regarding the readjustments still to be witnessed. Commercial failures this week are 266, against 286 last week, 221 the preceding week and 289 the corresponding week last year.

Marshall Field & Co.—Current wholesale shipments of dry goods are running considerably in advance of the corresponding period of last year. Shipments on fall orders also are well ahead. Road sales for both immediate and future delivery exceed those of a year ago by a considerable margin. Customers have been in the market in about the same numbers. Collections are larger.

Contract Prices

New York—In a hearing before the Public Service Commission on July 25, Vice-President James A. McCrea, of the Long Island R.R., stated that his company had just closed a contract with the Jamison Coal Co., covering their fuel requirements for the next 12 months at $3 per ton, or about twice the figure for the preceding year. The hearing was held for the purpose of taking up th question of increasing rates.

Cleveland, Ohio—A contract has recently been closed with a railroad for 150,000 tons of Pittsburgh No. 8 mine-run for delivery before Apr. 1, 1918, at $2.70 per net ton f.o.b. mine. Another contract has been closed with a local jobber involving 3500 tons of No. 8, 1¼-in. lump coal at $3.50 per net ton, f.o.b. mine.

Philadelphia, Penn.—Having rejected bids formerly made as being too high, the Board of Public Education received new tenders on July 20, and made awards as follows: In the 3rd, 4th, 5th, 7th, 10th and 12th districts, the Philadelphia & Reading Coal and Iron Co.: Egg, $4.45; stove, $4.70; nut, $4.80; pea, $3.10. In the 1st and 11th districts, the Lehigh Coal and Navigation Co.: Egg, $4.45; stove, $4.70; nut, $4.80. From these prices there will be a reduction of 20c. a ton for deliveries in July, 10c. in August, and flat rate to apply thereafter until the contract is completed. The above are mine prices. In addition the award was made for hauling at a rate of 75c. per ton, where delivery can be made from a drop yard and $1 when from tracks. The George B. Newton Coal Co. was low bidder on buckwheat coal at $5.35 for delivery in the 8th district, and they also submitted a low price of $6.87 for bituminous coal delivered at the schools. The Reading C. & I. Co. submitted prices of $2.80 for buckwheat and $2.30 for rice.

Hampton Roads—No bids were received in reply to the request for quotations on 10,000 tons of semi-bituminous for the year beginning July 1 for the National Home for Disabled Volunteer Soldiers.

St. Louis, Mo.—On the contract for the coal for the City of St. Louis, on which bids were opened on July 18, the fact developed that no bids were offered on coal for the City Water Works, the City Hall, the Isolation Hospital, Court House, Harbor and Asphalt departments. The City Hospital went to the Inland Valley on No. 5 washed Standard at $3.87½; Industrial School and Infirmary on Standard egg and the Workhouse on Standard lump to the Polar Wave at $3.82½; the Fire Department to the Polar Wave on Pennsylvania coal at $9.85; the Fire Department on coke at $13 to the Boehmer Coal Co.; Street Department on West Virginia smokeless at $8.24 to the Stephan Coal Co. The Polar Wave got the miscellaneous contracts on Standard lump at $4.32½; Staunton egg at $4.20; anthracite at $10.70, and miscellaneous coke contracts at $13. It is expected the City will have to purchase for most of its plants on the open market.

Current Events

Transportation Notes—In the month of May the New Haven Railroad handled 17,168 cars of coal, the largest in any month in the history of the road. The road has moved on an average of 1000 cars a month more than it did last year. The total number of cars of all-rail and Tidewater coal handled in June was 20,707, against 17,466 in the same month a year ago.

The Ohio Utilities Commission has postponed making a decision on the request of the railroad for a 15c. per ton advance on all intra-state traffic until July 31. The recent order of the Hocking Valley Railway Co., refusing cars for wagon mines, has been postponed until July 31, due to a protest from Washington.

Coal freight rates to practically all points west of the Mississippi River have been increased 15c. per ton, as a result of the Interstate Commerce Commission lifting the suspension it recently placed on the new schedules filed by the roads. The original schedule of the roads called for an increase of 15 per cent., but after the suspension was put into effect the roads agreed to accept 15c.

The railroads in the State of Washington have asked for an immediate increase of 15c. per ton on coal traffic, which is expected will be granted.

Fuel Shortage Items—One of the unexpected developments of the Government's recent request for four million tons of coal has been the announcement that the Ohio operators will be called upon to furnish a portion of this. The Ohio product will be used in Government buildings and other work of a like character, releasing additional tonnages of the high-grade West Virginia product for bunker purposes.

The Governor of Ohio is working on a plan to have all of the operators in the state obligate themselves to furnishing six million tons of coal for domestic use, which it is estimated will amount to six tons per family in the state. A Clearing House Committee has been appointed which will arrange to handle the distribution of this tonnage.

One of the commercial organizations of Kansas City has sent a representative to Washington to confer with Chairman Peabody of the Fuel Board, concerning the high prices of coal in Kansas City.

The City of Spokane, Wash., is contemplating establishing a municipal coal yard. A meeting of 20 of the leading coal dealers in Tacoma, Wash., was held recently for the purpose of discussing the best means of overcoming the existing fuel shortage, and the City of Portland has just appointed a fuel controller to study the same problem.

Pooling Tidewater Coal—The pooling arrangements went into effect at Baltimore on July 15, and at St. George, N. Y., on July 22; at Hampton Roads and Philadelphia the pool will be in full operation on Aug. 1. Some revision of the original classification made on July 6 was put in effect, and complete stipulations have now been issued, and developments of the plan will be watched with interest.

Legal—In the case of the West Virginia operators indicted for violation of the Sherman Anti-Trust Law, the court, on July 19, ruled that the indictment against the operators charged with conspiring to maintain prices of bunker coal, should be dismissed. The charges against the remaining operators were dismissed the week previous, and this now brings the matter o a complete close.

Labor—The greatest effects of the Kentucky coal strike are being felt by the small operators, a number of whom have been compelled to close down and it is expected that they may eventually be forced into an agreement with the miners. The larger companies are making a very heavy production. The miners of eastern Kentucky and Tennessee held a five-day convention ending on July 20 at which they formulated a series of demands to be presented to the operators.

Ocean Shipping—At a joint meeting of the Shipping Commissions of the United States and Great Britain, held on July 22, arrangements were concluded for restricting the requirements as to obtaining bunker coal in such a way as to force the neutral vessels into channels designated by the commission. The plan once in effect will virtually give the commission control of the world's shipping with the exception of Japanese vessels, which are realizing the full benefits of the existing high vessel rates without the risk incident to traversing the submarine zone. It is the plan of the commission to immediately take action to force substantially lower vessel rates.

The United States Shipping Board has turned over 24 of the seized German steamships to the French, Italian and Russian Governments, and these vessels are now being operated in the Atlantic trade.

Foreign Markets—It has developed that the German ships sunk or captured off the coast of Holland were engaged in transporting coal to Sweden, which Germany is exchanging for iron ore from that country. The purpose of the raid was to divert this shipping inland through Germany, thus throwing an additional burden on her transportation facilities.

A director of coal operations for the mines of Southeastern British Columbia, and Southwestern Alberta, was recently appointed with broad powers to investigate and remedy any conditions in the coal industry that may tend to increase production. C. A. Magrath, head controller of the Canadian fuel supply, had a conference with Chairman Peabody in Washington recently, and is now engaged in compiling an estimate of the fuel requirements of Canada for the coming winter.

Atlantic Seaboard

BOSTON

Another week without developments. Most buyers marking time, but the more prudent are getting coal forward. Movement all-rail is improved. Prices unchanged. Anthracite improvement very slight.

Bituminous—The midsummer dullness continues, a dullness emphasized by the apparent lack of any concerted policy on the part of shippers. There is a further lack of buying power throughout the market. Shippers as well as buyers are stalling, or so it would seem when one week follows another without any special development. Deliveries are being closely confined to such contracts as are on a basis higher than the "supposed" price of $3.64 per gross ton, f.o.b. mines, and those consignees who made high-priced contracts in April and May are similarly restricting themselves to getting coal forward. There are few sales of any of the grades. Only a small number of prudent consumers are seeking to buy at present market prices.

The Pocahontas and New River situation shows little change. Government requisitions are large and expected to be larger. Coastwise consignments were relatively small the past week, and there are many who are most apprehensive over the future. There is a distinct feeling among the Hampton Roads agencies that the Pennsylvania operators should be called upon to furnish their full share of the tonnage needed by the Army and Navy.

Six dollars and sixty cents has been mentioned as a recent spot price, f.o.b. Norfolk. Sales alongside Boston have been made at $8.75@9, or about on the basis of $6.20@6.50 f.o.b. This is about as close an indication of present prices as can be quoted today. Trade is on a very small scale at any price and few buyers are in position to furnish transportation for the coal they buy. The shippers are not anxious to sell; they prefer applying cargoes to contracts and thereby reducing their obligations while the going is good. Receipts at Tidewater are fair, but none of the factors is making committments more than a fortnight or so in advance. Careful review of the smokeless situation fails to disclose any indication of a slump. On the contrary an upward turn to the market would not be surprising any time between now and Aug. 15.

Locally, there is no appreciable change. Large consumers are accepting all the contract shipments they can get. There have been some systematic efforts to buy on the basis of current water freights plus $5.14 f.o.b., but so far as reported without success. The test seems to be whether the shipper who quotes, actually participated at the famous Washington conference. No sales of Pocahontas and New River are heard of less than $9.25@9.50 on cars, Providence or Boston.

"Pooling" arrangements went into effect at Baltimore on July 15, and at St. George, New York Harbor, on July 22. At Hampton Roads and at Philadelphia the "pool" will be in full effect Aug. 1. Some revision of the original classification was made July 6, but complete stipulations have now been issued and we shall soon have opportunity to judge the practical working out of the plan.

The Pennsylvania grades seem to preserve their status quo. Only a very few shippers are quoting the $3.64 basis, and these for delivery that strikes the ordinary coal man as rather indefinite. Some of the railroads have been in the market for some of this coal, but admittedly they are not able to get commitments on any volume. Sales have been made at from $4.35@4.75 f.o.b. mines for July or early August, and this is the coal on which good delivery can be had. A few consumers are paying these prices for the sake of laying in stocks for the fall. There is so great a scarcity of labor at the mines that unless a fair price is paid the coal cannot be mined. There is so little encouragement in the general situation that certainly no mistake can be made by taking coal when it offers. Stocks have been shrinking faster than supplies were forthcoming. It is realized that conditions today, bad as they are, are much more favorable for good movement than they are likely to be two months hence.

Bituminous at wholesale, f.o.b. loading ports at points designated, is quoted about as follows:

	Clearfields	Camb. and Somersets
Philadelphia	$5.00@5.80	$5.00@6.10
New York	5.30@6.10	5.30@6.40
F. o. b. mines	3.64@4.50	3.64@4.75
Alongside Boston (water coal)	8.35@8.60	8.50@8.75

Pocahontas and New River are quoted from $5.14@6.60 f.o.b. Norfolk and Newport News, Va., for spot coal, and $9.25@9.50 on cars Boston or Providence for inland delivery.

Anthracite—The retail trade is in a curiously anomalous position. The dealers actually have not enough orders to keep their teams busy and on the other hand they know that coal is going to be increasingly hard to get. Tidewater shipments show no improvement and even the better volume of

all-rail receipts only tends to diminish the supply for coastwise delivery. Dealers have the keenest apprehension over the future and any way they figure it the percentage received in New England last year is sure to be much reduced. Tows have been moving rather irregularly, as well, but conditions are smoother this week and receipts the rest of the month should improve.

The improvement in all-rail movement is not so great as we are asked to believe. One of the much advertised "solid trains" came through to Lawrence, Mass., but the other five got lost on the way. In other words the plan was not practical, and those who are dabbling with the coal business are fast getting to the point where they will admit their efforts are ineffectual. That would be a distinct gain to the whole situation! When the public does realize that there is a genuine shortage in New England the insistent demand will be something tremendous.

Chestnut was quoted as high as $7.40 f.o.b. New York this week; $6.15 is quoted freely as a July price for stove, f.o.b. mines.

NEW YORK

Anthracite dealers anxious about supplies. Domestic sizes short here, but rice and barley are plentiful. Board of Education opens bids for good-sized tonnages. Bituminous spot coals scarce, shippers taking care of contracts. Pooling to be general within a week. Car supply shows slight improvement.

Anthracite—Domestic coals show no improvement in supply and although dealers do not appear as anxious to stock up as they did a week or 10 days ago they are heavy buyers and some it appears would not be averse to paying premiums if assured of the coal within a reasonable time, but there are no operators or jobbers who would care to take a chance of displeasing the authorities.

Consumers in many cases, have taken advantage of conditions and in addition to filling their cellar bins, have been asking permission of city authorities to store coal in their back yards.

The west is calling for coal and the companies have been asked to hurry supplies forward. New Englanders dread to see winter approaching and salesmen report that there isn't any doubt but that many will have short supplies. Many industrial plants using hard coal are running short and may have to shut down unless shipments improve.

The three principal domestic coals, egg, stove and chestnut, are scarce, but jobbers are sticking closely to the Federal Trade Commission prices. Pea coal is freer and the demand is good. The steam coals are increasing in quantity. Buckwheat No. 1 is harder to get than either rice or barley. The two latter sizes are plentiful and prices are easy.

Current quotations, per gross tons, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual*
Broken	$5.50@5.50	$6.50
Egg	5.50@5.65	6.50
Stove	5.75@5.90	6.75
Chestnut	5.80@5.95	6.80
Pea	4.30@4.85	5.50@6.00
Buck	4.00@4.15	4.50@4.75
Rice	3.40@3.60	3.50@3.75
Barley	2.90@3.10	2.90@2.50
Boiler	.....	.....

*Based on the Federal Trade Commission's prices.

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—Spot coal buyers are having a hard time obtaining supplies. Most of the coal coming here is under contract and these consumers who neglected or refused to close contracts last spring are now facing the possibility of closing down. Some of these consumers would now willingly pay more than prevailing market prices for coal if they could get it. Much of the coal that would ordinarily come to this market is finding its way into the bins of all-rail dealers.

There is a heavy demand for bunker supplies, which accounts for much of the difficulty now experienced by local buyers in obtaining supplies. The pooling arrangement went into effect at the St. George piers on Monday of this week and is being carefully watched by the coal men. Western Maryland and Baltimore & Ohio coals are received at these piers. The remaining docks in the harbor are expected to be affected by the order on Aug. 1.

Line buying is active, particularly in New England where supplies are short, although railroad reports show that the roads are carrying increased tonnages into that section of the country.

Local operators are spending much of their time in the coal fields trying to bolster up production. Shippers as a rule complain of poor car supply although it has improved over last week.

The dealers are adhering closely to the Government prices for commercial supplies; namely, $3 net ton at the mines. Quotations for bunker coal ranges from $7 to $7.50 per gross ton alongside.

The pooling of coal which went into effect on Monday at St. George, Staten Island, was discontinued after a short test until Wednesday to enable those having it in charge to straighten out some matters regarding certain mines which had not been classified.

Car supply was reported as bad early this week. On the Baltimore & Ohio some operators had received from two to six cars, while others on the New York Central, Pennsylvania and B. R. & P. had not received any.

PHILADELPHIA

Anthracite dealers disappointed as to promised relief. Heavy rail shipments to New England and other points. School coal contract awarded. Some steam sizes being stored in city. Bituminous active, but supply short. Prevailing price, $3.25. Car supply unimproved and labor situation causing anxiety. High price coal for Canada.

Anthracite—There has been rather liberal use of box cars on the orders to the retailers here which has relieved many urgent cases. Naturally this class of equipment requires additional labor to unload, but even so they are gratefully accepted. It is certainly not as costly as the premiums which some dealers have been offering for company coal and which of course has always been refused.

There is general disappointment among the trade at the failure of heavy shipments to come in for July as had been promised by the larger companies though there is no doubt that these promises were made in entire good faith. The promise is still held out that good shipments will be made in August and that the present delay has been due to urgent instructions to keep up the shipments to other territories longer than was thought would be necessary.

An unusual feature of the trade is the increasing shipments being made by the Reading Co. all rail to New England points. Long 50-car trains of coal are being consigned daily to that district via Rotterdam Junction for through shipment. In the meantime there has been no dimunition in regular shipments via Port Richmond, although the heavy tide traffic of all kinds is interfering quite a little with the prompt movement over the piers and this also accounts no doubt for the increased rail movement.

Even should the expected improvement in shipment here fail to show up in August the officials in charge of the distribution are showing no concern due to Philadelphia's proximity to the mining region. However, embargoes may at any time upset these plans as has happened frequently of late when the dealers wondered why coal descended upon them almost in a deluge for a day or two, then ceased for two or three weeks.

In the meantime the trade is cheered up some by the production records and with the United Mine Workers' officials urging their men to do all in their power to increase the output it looks as though there would be enormous tonnage above ground before cold weather arrives.

Ordinarily the Philadelphia dealers depend on the storage plants of the big companies for about a million tons of coal to see them through the winter, but at the present time the storage yards are almost as bare as the dealers' yards, with the exception of some of the very smallest steam sizes. However, if the coal is judiciously distributed, there need be no fear of a coal famine this year. In this connection dealers should follow suggestions of the shippers and discourage extravagant buying by some of their trade. All retailers admit that practically all of their wealthy customers placed large orders this spring and most of them were increased over other years. When the dealers do procure coal they deliver these "padded" orders without question instead of trying to conserve part of it and put it where it will do the most good.

The sale of the Susquehanna Coal Co. to M. A. Hanna & Co. of Cleveland is giving much concern to some of the local trade who have been entirely dependent upon the former company for their supplies. Dealers on the Pennsylvania tracks who have been the largest purchasers of this coal fear the production will now be diverted to the Western market.

The dealers located on the Pennsylvania tracks continue to suffer more for coal than their competitors on the other roads. No Reading cars are being delivered to the Lehigh Valley for shipment to points on the Pennsylvania; the Reading still refuses to deliver cars to the Pennsylvania, but has removed the embargo on shipments to the B. & O. Restrictions on Reading cars to points on the Western Maryland have also been called off for the time being.

The steam sizes are probably weaker, although some rice coal has probably been stored in the region. At least one company is also storing barley. Several of the larger retailers in the city who have extensive steam trade customers are also taking advantage of the temporary lull in the small steam sizes and are storing these very heavily in vacant spaces nearby.

Broken continues out of the market, although a large buyer of the other sizes is now and then favored with a car or two for some special and pressing purpose. Egg and stove show no falling off; the local trade generally demands more stove, but the suburban dealers are just as short of egg, of which they are the largest users in this section. Chestnut for some time has been the easiest of the prepared sizes, but this week we know of one dealer who offered another 75c. per ton premium for company chestnut coal standing on his track. If this is any indication of the condition it will be some time before even this size is in surplus, as is usually the case in summer.

Pea does not improve and is the one size over which the dealer has cause to be alarmed. The tonnage to be furnished the Board of Education before fall is only one more obstacle to prevent dealers storing it. The first of August is sure to find every Philadelphia retailer with more unfilled pea coal orders on his books than he has coal on hand of all sizes. This, too, at a time when he is usually accustomed to receiving more of this size that he could store.

As indicated here some time since the School Board was successful in having the operators bid direct on their supply of coal for the coming year and has effected a large saving over the bids as presented by the retailers, as the coal was practically offered at the circular prices with the exception of pea coal, which was bid at the winter circular. The dealers are just as well satisfied that this business has been taken care of, although a number are disappointed that the hauling was let to an outside contractor, who very materially underbid the dealers.

The prices per gross ton f.o.b. cars at mines for line shipments and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$5.00	$6.15	Buck	$2.90	$3.80
Egg	4.25	5.35	Rice	2.40	3.40
Stove	4.50	5.70	Boiler	2.20	3.30
Nut	4.60	5.65	Barley	1.90	2.15
Pea	3.20	4.10			

Bituminous—There is extreme activity in the trade and inability on all sides to get sufficient coal to meet the demand. Shipping offices are flooded with inquiries from all sources, particularly from the heavy consumers. The price of $3 for mine-run and $3.50 for lump coal, per net ton, is generally maintained, and usually with the 25c. brokerage added. As it now stands the prevailing price is usually $3.25, for there is very little lump coal being screened, and most houses are adding the extra 25c. for brokerage. With the idea of getting coal at this figure consumers are now making strong efforts to stock as heavily as possible in addition to current needs. It is thought that the contract trade is probably receiving the greater bulk of the production reaching this city, as the car supply fails to improve, despite promises by rail interests that they hoped to be in position to increase the car allotment. This week the number of cars received by Pennsylvania shippers averaged between 50% and 60%.

To be sure the labor situation is not at all satisfactory, for with the recent recruiting of the regular and volunteer forces to their maximum the mines have suffered. This not so much by taking men directly from the mines, but the industry has long felt the dimunition in the supply of new labor which is necessary at all times to meet the replacements in the mines.

There are still persistent rumors that some coal continues to be sold at prices in excess of the agreed upon figures, but the amount is not sufficient to affect the market. It is known that heavy shipments have been made to Canada lately, where the manufacturers especially are trying to fortify themselves against the usual interruptions to rail movement in the winter season. This coal is not covered by the Government agreement and the prices received for it are much higher than the rate prevailing here. This movement naturally has a tendency to divert much fuel from the domestic market.

All plans have now been carefully arranged for the inauguration of the tidewater pool on Aug. 1.

BALTIMORE

Bituminous trade here now adhering to the Government figures. Movement poor and supply light. Hard coal is scarce.

Bituminous—Practically all selling of spot coal here at figures in excess of the $3 and $3.25 mine basis has come to an end. The Government figures are ruling generally, and will undoubtedly hold in this section until after the Government legislation regarding fuel prices and distribution is sifted down. That does not mean that there is any considerable amount of this cheap coal in evidence here. Practically the entire movement at the moment, which is restricted under a poor car supply at the mines, is devoted to contract fuel and to coals for bunker use. Some little spot coal is finding its way through and is being distributed as a sort of special favor to customers here. The City of Baltimore had an offer of some of this cheap coal at a great contrast with spot prices which the municipality had been forced to pay over a period of several months.

Coastwise and harbor fuel movement through the pooling exchange is going on here smoothly. There have been naturally a number of tangles to straighten out. Some few consumers have complained that they are forced to take a chance regarding the coal they get off a particular classification track. Most of these are users of certain specialized coals who object to any other fuel than that from some particular mine. These complaints are not serious, however.

Anthracite—As August approaches with but a small part of their book orders delivered, as compared with other years, the hard-coal men are growing uneasy. Many consumers are now urging deliveries. It is impossible to get through coal as desired, even with the payment of premiums of material size. Egg and stove sizes are particularly short. Many of the yards here are cleaned up and not a few dealers the past week delivered practically no coal at all to consumers. With a heavy troop movement imminent, and with the prospects of a crush on the railroads of army supplies both for this country and trans-Atlantic shipment, dealers here are looking for little relief in August, and are expecting the tightest fuel market this fall that the trade has ever experienced. Much interest is felt in the possible outcome of Government legislation regarding prices and distribution, but just now it is a question of transportation puzzle.

HAMPTON ROADS

No current sales for domestic business. Some orders taken for export. Congestion at Newport News. New demurrage and trimming tariffs effective Aug. 20.

Coastwise business seems to be confined to contract tonnage, shippers seemingly not caring to take any new business under present unsettled conditions as to price. In contrast to domestic sales the export market is firm and considerable business is reported closed for prompt shipment. This is the only class of business that is at all attractive under present conditions. At Newport News vessels are meeting with protracted delays due to various causes. Coal is, of course, in short supply and labor is not of the best. Weather conditions have been unfavorable for the past three weeks, due to heavy rains. At times all work at the piers has to be stopped on this account.

The three railways serving the coal trade of Hampton Roads have filed new tariffs for dumping and trimming effective Aug. 20. The increases shown are heavy, in some instances being as much as 50 per cent. The disposition seems to be to charge what the traffic will stand. Demurrage tariffs have also been filed reducing the present average free time of seven days to three days. Up to the present the Chesapeake & Ohio and Virginian have not charged demurrage on Tidewater coal, but they have now established this principle on the basis of the foregoing, being the same as the Norfolk & Western. As the arrival of vessels is always more or less indefinite shippers will, no doubt, have some heavy demurrage bills to pay. Heretofore the Chesapeake & Ohio and Virginian Rys. have not had any Tidewater demurrage but have used the embargo to regulate the number of cars which any shipper might have under load at any one time. The Norfolk & Western Ry. seems to be getting a trifle nervous over the failure of certain shippers to sign the agreement for the Tidewater pooling of their coal. The railway companies no doubt realize that they have no authority to include the coal of any shipper in the pool without the shipper's consent.

The coal-laden barge "City of Washington," ashore on one of the Florida reefs, is now reported to be a total loss, both cargo and vessel. The tug and barge "Seneca" have arrived at Key West.

The National Home for Disabled Volunteer Soldiers, located on Hampton Roads, advertised recently for bids for 10,000 tons of semi-bituminous for the year beginning July 1. There was not a single bid received. This is an indication of the reluctance with which shippers are willing to quote for future delivery.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	June 30	July 7	July 14	July21
Nor. & West...	140,787	99,789	117,442	141,310
Ches. & Ohio...	101,858	89,239	81,769	90,993
Virginian.....	86,911	82,943	82,769	96,385
Total.....	329,556	271,971	281,980	328,688

Ocean Shipping

OCEAN FREIGHTS

The freight market is practically the same as a week ago, a number of steamers and sailing vessels were chartered for export coal during this period, but none of these fixtures have been reported.

It is becoming extremely difficult to secure steamers for export coal, owing to the great scarcity of tonnage, but we still have a number of steamers available for coals to Brazil and the West Indies.

We would quote freight rates on coal by steamer as follows:

Europe	July 16	July 23
Marseilles.....	$100.00 about	$100.00 about
Spain (Atlantic)*	30.00@36.00	42.00 about
Spain(Med't'n)*.	32.40@38.40	44.40 about

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

South America		
Montevideo.....	$30.00@31.20	$33.60@36.00
Buenos Aires....	30.00@31.20	33.60@36.00
Rosario	31.20@32.40	36.00@38.40
Rio Janeiro.....	[3]32.50 about	[3]32.00 about
Santos.....	[3]34.00 about	[3]34.00 about
Chile(good port).	16.50@17.50	16.50@17.50
West Indies		
Havana.....	5.25 about	5.00@5.25
Cardenas, Sagua.	6.75@ 7.25	6.75 about
Cienfuegos.....	6.75@ 7.25	7.00@7.25
Port au Spain....	10.25@10.75	10.50 about
St. Lucia.....	10.25@10.75	10.50 about
St. Thomas.....	8.75@ 9.25	8.50@9.00
Barbados.....	10.25@10.75	10.50 about
Kingston.....	7.00@ 7.25	7.00@7.25
Curacao[1].....	8.75@ 9.25	8.75@9.25
Santiago.....	7.25 about	7.25 about
Guantanamo.....	7.25 about	7.25 about
Bermuda.....	6.00@7.00	6.00@6.50
Mexico		
Vera Cruz.....	9.00@10.00	9.00@10.00
Tampico.....	9.00@10.00	9.00@10.00

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port. [3] Net.
W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

Two dollars and twenty-five cents to two dollars and fifty cents is the range of the market for barges, 1500 to 2000 tons, Hampton Roads to Boston. Steamer tonnage could probably be had for less if quick despatch could be guaranteed at both ends.

Long Island Sound freights are unchanged from $1.35@1.50, depending on destination; $2 is being paid from New York to Boston.

Lake Markets

PITTSBURGH

Some export business done. Price agreement not entirely satisfactory. Prospects of Government regulation.

An export market for Pittsburgh district coal has become more or less established, at $3.25@3.50 for slack and mine-run and $3.50@3.75 for screened coal, per net ton at mine, and a moderate volume of business has been done. The agreement as to coal prices for the domestic trade is not working out as well as was expected. Even at this late date there is not much coal offered, and brokers testify that they have customers for much more coal than they can secure from operators. The decrease in offerings is attributed chiefly to operators shipping full tonnages on contracts whereas when they could secure fancy prices in the spot market they limited their contract shipments in accordance with car supply. Most of the large steel mills state that they are securing all the coal they require and some assert that they have not yet paid the agreed price, including the full brokerage.

The market situation is sufficiently unsatisfactory as to make it probable that if the food control bill as finally approved authorizes the President to regulate coal prices he will promptly take steps to do so. Since the operators' agreement on the $3 basis many consumers have expressed the expectation that a lower price would eventually be fixed and they will no doubt present their claims to Washington.

We quote the domestic market at $3@3.25 for slack and mine-run and at $3.50@3.75 for screened coal, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous prices much easier. Selling proceeding cautiously, with regulation price gaining. Contract well kept up. Anthracite moving well, especially by Lake.

Bituminous—The situation does not change much, but such change as there is tends toward the uniform price and, what is more significant is that the exorbitant prices of last spring are gone now. The jobber is pretty generally selling at a profit of 25c. a ton and to consumers only, while the operator is not asking the former $5 or $6 a net ton at the mine, but is usually somewhere in the $3 limit. It now looks as if the market would settle down to $3 for slack and $3.50 for three-quarter at the mines, with mine-run mostly dropped. In this way the situation simplifies very much from what it was. The three-quarter brings a good price here and the slack is in a way to sell at a price over $3 in Canada at least, while consumers there are ready to pay the advance because the duty on slack is less than it is on sizes.

There are at the same time plenty of jobbers who stoutly maintain that they are paying no attention to the Government price and not only that, but they are making a good thing out of the higher prices. At the same time they are mostly selling under the cover of a proviso that is expected to meet any move on the part of the authorities to enforce the $3 price. It appears that most of them can get coal at $3 or about that and, of course, they are doing so as far as possible. While the supply is not improved, the market generally is much steadier than it was a month ago.

The prices of bituminous are based on $3.75 for Pittsburgh to the consumer, as follows:

Youghiogheny Gas.....	$5.25@5.75
Pittsburgh Steam.....	5.00@5.50
Ohio No. 8.....	4.90@5.40
Bessemer.....	4.85@5.35
Allegheny Valley.....	4.75@5.25
Cambria Co. Smithing.....	5.00@5.25
Pennsylvania Smokeless.....	5.10@5.50
All Slack.....	4.65@5.10
Cannel.....	5.75@6.25

All prices are based on net tons, f.o.b. Buffalo. The effort is made to fill all contracts to the limit, leaving very little free coal to put on the market.

Anthracite—The trade is quieter, though the demand keeps up. Shippers do not expect any falling off now, no matter how hot the weather is. The consumer looks on coal as a prime investment and at the same time he buys, as he believes, as a measure of safety. Nothing can disuade him of the belief that coal is going to be abnormally high next winter, or may even give out entirely.

Certain anthracite jobbers are getting notices from the Government, warning them that they must adhere to the regulation profit laid down last June, or there will be unpleasant consequences. As a rule they claim that they have sold according to the directions given them.

Local anthracite distribution continues at a good rate and there is less complaint than formerly. Lake shipments are large, the amount for the week, 134,500 tons, being about the largest of the season. The clearances do not include any from Chicago, which is very unusual. They were 60,000 tons for Duluth and Superior, 23,200 tons for Port Arthur, 19,000 tons for Milwaukee, 14,700 tons for Marquette, 10,500 tons for Fort William, 7100 tons for Green Bay.

Freight rates are 42½c. for Duluth, Port Arthur and Fort William, 50c. for Milwaukee, 55c. for Marquette and 75c. for Green Bay.

TOLEDO

Demand from dealers sluggish. Lake shipping increasing as more vessels are brought into service. Big steam users endeavoring to secure supply ahead.

The demand for steam coal is becoming brisk as the large buyers seem to have awakened to the fact that prices are established at last. All appear to feel a coming shortage of motive power and cars when the crops are ready for movement and government supplies start moving toward the army concentration camps. There is hardly a factory or public institution in the city which is not trying desperately to get a surplus of coal. When the Government puts every ship which it has or can

commandeer into service the amount of coal needed for them will be three or four times that consumed in normal times.

Little buying in the domestic market is being reported. Coke is selling fairly well but anthracite and other domestic sizes of coal are scarce.

The local docks are working night and day to rush all available coal to the Northwest. While more vessels have been engaged as coal carriers, Lake men assert there is still a shortage, and they expect to see a scarcity of tonnage at the head of the Great Lakes at the close of navigation.

Prices are as follows, f.o.b. mines:

	Mine run	Lump and Egg	Nut and Slack
Hocking & Pomeroy	$3.25	$3.75	$3.25
West Virginia Splint	3.25	3.75	3.25
Kentucky	3.25	3.75	3.25
Pocohontas	3.25	3.75	3.25

CLEVELAND

Poor car supply seriously interfering with production. Large consumers very short of fuel. Canadian representatives offering premiums.

The car supply has been so poor at Ohio mines the past week that it has seriously cut down the production, and if not improved, will soon cause serious trouble to large consumers of steam coal as they have no stocks on hand and have only been getting enough coal to run them from day to day. This has also affected Lake shipments and has forced several vessels to go up light because there was not enough coal at docks to load them.

A peculiar situation has developed the past few days. While practically all operators are living up to the price agreement made with the Government officials, effective July 1, several offers have been made by buyers representing Canadian parties at higher prices than those agreed upon, though we do not know of any such offers being accepted.

A contract was closed with a steam railroad for 150,000 tons Pittsburg No. 8 mine-run, to be shipped prior to April 1, 1918, at $2.70 per net ton f.o.b. mine, and one for 3500 tons No. 8 1¼-in. lump, with a jobber, at $3.50 per net ton f.o.b. mine.

The city officials of Cleveland have not as yet reached a decision regarding the purchase of a municipal coal mine, and Mayor Harry L. Davis has stated that it is probable no decisive action will be taken until the city can obtain the services of an expert to investigate each proposition and make a report.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine run	Slack
No. 8	$4.40	$3.90	$3.90
Cambridge	4.40	3.90	3.90
Middle District	4.20	3.90	3.90
Hocking	4.40	3.90	3.90

DETROIT

Steam-coal users delay orders, hoping for lower prices. Anthracite trade is sluggish. Shipments by Lake gain in volume.

Bituminous—Hope of lower prices on steam coal exert a deterrent influence on buying in the Detroit market. A number of consumers, according to the jobbers, are showing no disposition to purchase coal in quantities larger than are needed for current consumption. Present conditions suggest that even greater difficulty may be met in obtaining coal later in the season, when car shortages become more serious, owing to the demand for equipment in handling war supplies, troops and crops. These arguments appear not to have had much influence with the consumers.

Household users of domestic coal are not buying freely. They also feel that if they buy heavily now, a lower price might be made later which would interfere with their getting back their investment with a profit.

Anthracite—Receipts of anthracite in the Detroit market are described as lighter than usual for this period of the year. Retailers are not, in many cases, showing much interest in buying and many of the larger dealers already have obtained a supply which they regard as sufficient for current requirements. Some of the retail dealers have not yet made delivery on orders booked as far back as March.

Lake Trade—Movement of coal to the docks is proceeding more freely than a few days ago. Vessels which have been delayed in discharging ore cargoes, due to lack of cars, are receiving better dispatch, which increases the supply of vessel tonnage offered for the movement of coal. Rates as high as $1 a ton are being offered on shipments to some of the smaller upper Lake ports, where unloading facilities are not first class.

COLUMBUS

Domestic and steam trade quiet. Activity centers on the Lake trade. Efforts being made to get consumers to place orders early.

The market is rather quiet, with the exception of the Lake trade, which is showing renewed activity. Miscellaneous steam users are not buying to any extent and the same is true of retailers. Outside of the fuel required for large mills and railroads and for Lake shipment, the movement is not large, but these factors are absorbing all of the production and there is no oversupply in any quarter. Prices are maintained at levels fixed by the Washington conference.

Lake shippers are working to catch up with orders and with a fairly good car supply have succeeded in making extra good records during the past few weeks. Vessel movement is good and the coal is being moved from the upper Lake docks almost as fast as it arrives. With a good fall season it is expected that the requirements for the Northwest can be met. Lake prices continue high and there has been no cancellation of contracts as a result of the price fixing conference. Free bottoms are almost unknown.

Steam business continues fairly active, especially in supplying iron and steel plants, which are requiring a large tonnage. Some effort is being made by large consumers to stock up to guard against a car shortage in the fall. Railroads are also requiring a large tonnage for the movement of trains. Smaller steam users are rather slow in placing orders as they are content to let matters drift in the belief that prices are now fixed and everything is settled. Efforts to have them stock up for the future have not met with any great degree of success.

Domestic trade is quiet to the extreme. Dealers are not stocking up because of lack of orders from consumers. Governor Cox's advice not to buy until after Sept. 1, has caused almost a complete cessation of buying. Dealers, who have been trying to dispose of high-priced coal have not sold any large amount. Retail prices are still unsteady and show a wide range. Hocking lump is selling between $5.50 and $6, while Pocahontas is quoted between $6.75 and $8. Pocahontas is rather quiet. Anthracite is scarce and little is moving in this territory.

Production has been rather good in all Ohio fields. A good car supply on the Hocking Valley has kept mines in operation to capacity. Pomeroy Bend field is also producing a large tonnage and the same is true of Crooksville, Massillon and Cambridge. eastern Ohio is still hampered by short car service.

Prices on short tons, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$3.50	$3.50	.....
Inch and a quarter	3.50	3.50	$3.50
Three-quarter inch	3.00	3.00	3.00
Nut	3.00	3.00	3.00
Egg	3.00	3.00	.....
Mine run	3.00	3.00	3.00
Nut, pea and slack	3.00	3.00	3.00
Coarse slack	3.00	3.00	3.00

CINCINNATI

Uncertainty as to Government action exercises some influence, but the market remains strong and demand insistent. Car and labor situation is not encouraging.

While the trade and the public both remain wholly uncertain as to Federal and State action looking to the control of the coal market, the fact that the supply and the demand are so close together is the controlling influence. The demand remains very strong, and as far as steam consumers are concerned, is without reference to the prices tentatively fixed at Washington. There is considerable anxiety among large consumers as to their ability to secure any assurance of sufficient coal for the coming season, and they are naturally paying little attention to price.

The domestic situation is good, although the big volume of business is that going North and Northwest, both via rail and the Lakes. Locally domestic consumers are showing a tendency to wait for lower prices, as they believe that levels much below those now prevailing will be fixed arbitrarily by the Government. Dealers are doing their best to dissipate this idea, and are urging consumers to lay in their winter's supply of coal now, at prevailing prices. So far, however, there has been comparatively little local buying of prepared sizes, as far as consumers are concerned.

LOUISVILLE

Market quiet, with domestic consumers still waiting. Labor outlook causing apprehension. Car supply improved, but short working forces tend to hold production down.

Continued indifference on the part of domestic consumers to recommendations that they put in coal for winter consumption is still a feature of the Kentucky coal trade. Retail dealers also are deaf to the urgent representations of operators that they stock, while, for that matter, numbers of the operators with retail connections are said to be selling out of hand rather than stocking in their own yards. Retailers who are convinced that there will be a shortage of domestic sizes this winter are being deterred from buying in part by the uncertainty as to what the Government may do in the way of fixing retailers' prices.

The car supply during the week has been considerably better but the labor situation is the cause of much apprehension. The strike in Western Kentucky is having the effect of closing some of the small operations, although for the most part the larger workings are producing more coal than they have for several months. A strike looms as more than a possibility in the eastern Kentucky-Tennessee field, where the workers have presented demands to the operators who have so far declined to treat.

Mine workers, indifferent to increased earnings, have abstained from work, with the result that there have been numerous instances of empties standing overnight on mine sidings, a thing that has not happened for many weeks. The labor stringency extends to the retail field and those retailers who are doing any business find it difficult to get men to handle their coal. Prices are without change.

BIRMINGHAM, ALA.

Trade shows but slight improvement, inquiry being light. Maximum quotations rule for the respective grades. Car supply generally very fair. Miners working irregularly seriously cripples production.

The demand for coal in the local market has been rather slow the past week, a very slight improvement in inquiries being reported from some quarters. It is stated that the supply of coal has been correspondingly short, and difficulty has been experienced in some instances in filling the limited orders offered. A number of the railroads were in the market for additional coal, an order for 10,000 to 12,000 tons being placed by one line, split between several operators, at $3 per net ton, mines.

Some contract business was offered during the past week, but on account of the unsettled labor conditions and a lack of knowledge of the quota of coal which will be apportioned to this district for Government requirements, operators are not in a position to take on further contract obligations at this time. A committee of local coal men is attending the conference of representatives from the several coal-producing centers, which is in session in Washington this week with Chairman Peabody's committee on coal production and distribution, at which meeting the tonnage to be supplied by each section for Government requirements will be determined upon.

Quotations are as follows per net ton, mines: Black Creek and Cahaba, $3.75@4; Pratt, Carbon Hill and Corona, $3.25@3.50; Big Seam and other lower grades, $2.75@3.

Operating conditions at the mines are being seriously affected by labor agitation, and miners are working on a very irregular schedule. As a result the output is far from the maximum capacity.

Coke

CONNELLSVILLE

Spot market declines slowly. Prospects of Government price regulation. Surprise that shipments have not increased.

The spot coke market has continued its decline, with most of the recent buyers out of the market, asserting that they are well supplied with coke, but probably being actuated also by an expectation that the Government will soon regulate coke prices, placing them much below the present market. The food control bill as passed by the Senate last Saturday gives the President choice of two courses, to take possession of plants and operate them, or to require producers to sell to a Government agency. If compensation offered is not satisfactory, plant owners can accept 75 per cent. of the amount offered and sue the United States according to the Judicial Code. There does not seem to be much doubt that the provision will remain in the bill as finally shaped up in conference between the two houses.

The attitude of coke operators is evidently to secure as much for their coke as possible before any possible regulation is made effective. They show no disposition of meeting the Government halfway or of reducing prices so as to forestall official action. Among consumers the feeling is growing that the coke operators have been quite content to see production restricted as total profits have thereby been increased as compared with a year ago when there was a much larger output.

The Baltimore & Ohio has just ruled that its cars must not be shipped off its own tracks, thus adopting the policy the Pittsburgh & Lake Erie has followed for some time. As a result, coke loaded in B. & O. cars is at a discount, the same as P. & L. E. coke, as compared with Pennsylvania, and has been available in some instances down to $9.75, while Pennsylvania has brought $10.50 to $11. The market is off about $1 a ton in the week, and has declined as much since July 4 as it had advanced during an equal time before that date, the top having been about $16. We quote spot coke at $9.75@11 for furnace and $11.50@12.50 for foundry, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 14 at 349,519 tons, an increase of 301 tons, and shipments at 349,001 tons, a decrease of 6687 tons. As there was a fairly full supply of cars in the week, while the preceding week included a holiday the showing has caused some surprise.

Buffalo—The market is active, but the high prices are beginning to drop, no doubt on account of the price. Local quotations are $15.75 for 72-hour Connellsville foundry, $13.25 for 48-hour furnace and $11.75 for low grades and stock.

Birmingham, Ala.—The coke market is very strong and inquiries are much in excess of the available supply. Spot foundry is selling from $15 to $16 per net ton, ovens, while contract business brings $12.50 to $14. Furnace coke is reported as bringing from $6 to $8 per ton, ovens. The supply for outside territory is small. A nominal tonnage of coke is being shipped to Mexican smelting interests, being consigned to Laredo, Tex., and reshipped to industries across the border.

Middle Western

GENERAL REVIEW

Demand for domestic sizes improving. Retailers having difficulty in supplying householders. Shippers have a plethora of orders. Car situation unimproved and labor conditions unsatisfactory. Anthracite all-rail shipments westbound far below normal.

There has been a much better demand for domestic sizes the past week than for some time due to the fact the householders are becoming more reconciled to the new prices and appreciate the unusual conditions existing. Retailers who could not keep their teams busy several weeks ago, on account of cancellations, are now unable to take care of all the business offered and shippers are being asked to hurry deliveries. Operators in the most favored fields are running with sufficient orders to keep the mines busy for the next six weeks, and other districts are sold-up anywhere from two to three weeks. Very little, if any, free coal is offered. Prices are about stationary, the government maximums ruling for the time being and with indication of any change.

The shortage at the head of the Lakes is as acute as ever, and dealers are not at all hopeful of its being relieved at an early date. Up to July 15 the docks at Duluth and Superior had received a total of 543,760 tons of anthracite and 2,030,000 tons of bituminous. Stocks on the docks are not gaining, as shipments to interior points and the local demand are absorbing practically all the receipts. It is estimated that a movement of at least 2,000,000 tons per month up the Lakes from now on is absolutely necessary to prevent a shortage of Eastern coals. The shortage of anthracite is more acute than on bituminous.

Labor conditions are far from satisfactory. Miners have been short for months and tendencies toward strikes are being shown in the mining districts while several cases of labor troubles have been noted the past week.

The railroads are beginning to show signs of distress. Embargoes have been placed by a number of roads and supply of empties has decreased. With movement in the near future of crops, troops and munitions, it is not pleasant to figure what will happen with the beginning of the Fall rush.

For the three months' period, April to June, inclusive, there has been approximately an 80% increase in the tonnage produced in the Illinois, Indiana and West Kentucky fields, 70% in the Rocky Mountain States and about 40% in the Southwestern field of Iowa, Kansas, Missouri, Oklahoma and Arkansas. Based upon these percentages, the tonnage produced April to June this year as compared with the same period last year, will show an increase of approximately 12,000,000 tons, and two-thirds of this amount, or 8,000,000 tons represent the increased movement from Illinois. Fully three-fourths of the increased tonnage produced the last three months has gone into current industrial consumption, is already used up and has provided no reserve for later demands.

CHICAGO

Prices are variable. Railroads continue to make heavy purchases. Chicago retailers unable to supply immediate demands of householders who are concerned over supply. No improvement in car supply.

The Chicago coal market is in much better shape than it has been for some weeks. Orders that were cancelled a week or ten days ago, on account of the uncertainty of the government maximum prices as issued by the Illinois Coal Operators, have been reinstated, and shippers now have sufficient business to keep the mines in operation from three to six weeks. The mines producing the higher grades of coal are the farthest behind on shipments.

A strenuous effort is being made by the Illinois State Council of Defense to reduce prices on coals sold in this market, especially on Illinois grades. Public officials compare the present maximum prices with those that existed during the dull periods of 1914 and 1915 when prices were about one-half what they are now. A committee of seven has been appointed to settle the controversy, and the first meeting was held on Tuesday, July 24.

Shipments of anthracite all-rail have been extremely light due to shortage of cars and on account of the heavy movement of these coals to the Eastern markets. Chicago and immediate territory are depending almost entirely upon Lake movement, which has been heavier than for some time but is not satisfying the demands. The lack of the higher grades of bituminous coals is partly responsible for the heavy and unusual demand for anthracite.

The Franklin County mines have operated the past week about 65% of full running time, the lost time being due to shortage of cars. Demand has been steady on all grades, orders coming from a widely scattered territory such as New Orleans and Texas to the south and the Dakotas on the north. Sufficient orders are now on the books to keep the mines running full capacity for the ensuing six weeks. A notable improvement is shown on steam coals, especially screenings. There has been no change in price since the government maximums went into effect a few weeks ago. At the present rate of production these mines will output more than 1,000,000 tons this month.

In the Williamson County field the car supply has averaged about 60%, which is a trifle better than for the previous week. The demand has been steady and orders now on hand are sufficient to keep the mines in steady operation for 30 days. This is also true of Saline County, except that car supply has only averaged about 55%.

In the Springfield district prices are not quite so firm as in other fields. Car supply has shown signs of improvement, and the demand has been less active, causing a reduction, in some instances of not more than 25c. per ton on domestic sizes.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton and Peoria Cos.	Clinton and Sullivan Cos.	Green and Knox Cos.	Carterville
Domestic lump	$3.25@3.50	$3.25@3.50	$3.25@3.50	$3.00@3.25	$3.50
Steam lump	3.06@3.25	3.00@3.25	3.00	3.00	3.25
Egg	3.25@3.50	3.25@3.50	3.25@3.50	3.00@3.25	3.50
Nut	3.25@3.50	3.25@3.50	3.25@3.50	3.00@3.52	3.50
Mine-run	2.50@2.75	2.50@2.75	2.75	2.50@2.75	2.75
Screenings	2.50@2.75	2.50@2.75	2.75	2.50@2.75	2.75

	Williamson and Franklin Cos.	Saline and Harrisburg	Poca. and W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.50	$3.50	$3.75	$3.75	$3.50@3.75
Egg	3.50	3.50	3.75	3.75	3.50@3.75
Nut	3.50	3.50	.....	.....	.....
No. 1 nut	3.50	3.50	.....	.....	.....
No. 2 nut	3.50	3.50	.....	.....	.....
No. 3 nut	3.50	3.50	.....	.....	.....
No. 1 washed	3.50	.....	.....	.....	.....
No. 2 washed	3.50	.....	.....	.....	.....
Mine-run	2.75	2.75	3.25	3.25	3.25
Screenings	2.75	2.75	3.25	.....	3.25

Hocking Lump $3.75 Splint Lump $3.75

The Fulton and Peoria county mines have had a fairly good supply of cars with no change in recent maximum prices as fixed by the government. The greater part of this tonnage is under contract, and account of heavy demand for fuel no material change is expected on what free coal will be offered from this field.

The car supply in the Indiana field has been far from satisfactory. Shipments have been very heavy to points in Michigan, Wisconsin and Minnesota, with prospects of heavier buying than ever before in states outside of Indiana. Prices have been firm on domestic sizes, and steam coals ranging from $2.50 to $2.75 per ton at the mine.

Shippers of smokeless coals are disposing of their product direct to retailers and the jobbers are experiencing a great deal of difficulty in securing shipments. Apartment buildings are making a desperate effort to store during the summer months, but on account of the government demands only a small portion of the production is moving to this market. Railroad difficulties have interfered to some extent with shipments during the past week

There has been a better movement of Hocking to this section than for some time. The new price makes these coals more of a competitor with the better grades from Southern Illinois. Prices are very firm at the new maximums, namely $3.75 at mines on prepared sizes.

On account of embargoes on railways operating north from Cincinnati to Lake Erie ports, movement of East Kentucky coals to the Chicago market has been better than for some time. The minimum price has been $3.75 and plenty of business is available at this figure.

La Salle, Bureau, Will and Grundy Counties coals are quoted in the Chicago market as follows:

Lump—Furnace—No. 1	$3.50
Screenings	2.75
Mine-run and Steam Lump	2.75

ST. LOUIS

Conditions unusually easy, with practically no demand; there is very little free coal except high grade. Car shortage unusually acute and no shipments of Eastern coal.

There is almost no local demand, but to offset this, there is practically no Standard or Mt. Olive coal offering. On Williamson and Franklin County coal there is no demand at all, and plenty of this grade is being offered.

The most distressing feature of the present week is the car supply. Some mines on the Iron Mountain line worked only a day and a half, and at other places there has not been over a two days' supply excepting at mines working on railroad coal where full equipment is furnished.

The demand farther in the country is not as good on high grade as might be expected, and the operators are pushing their coal. Some mines have orders ahead, but most of them are working on a day to day proposition, afraid to book orders ahead, on account of the car shortage.

Some Carterville coal is quoted as low as $3 for domestic sizes and mine-run as low as $2.50, with screenings slightly under that. The movement of this coal to the Northwest is not as great as was anticipated. The public are still holding off, hoping that prices will decline.

The Mt. Olive field continues to work more regularly than the others, with a shortage of domestic coal on account of the unusually large tonnage of railroad fuel being shipped and also on account of no equipment in which to move domestic coal. Prices remain firm in this field.

There has been a shortage of Standard coal for the past week on all sizes, and

this market remains steady, with a tendency to get stronger. The greater portion of the coal from this field is being shipped on railroad contracts, and this is taking tonnage from the domestic market. Locally the domestic condition is a peculiar one. The public resent the high prices and are switching from the higher grade to the lower grade fuels.

The freight rate increased 15c. a ton through the St. Louis gateway to points west of the river this week, thus equalizing the increase throughout the territory, excepting in the State of Illinois, where it has been suspended.

The tonnage of anthracite was almost nothing this week, and smokeless was unusually light. Arkansas has almost stopped moving in. There is very little demand for these coals on account of the high prices, and dealers are urging the purchase of the cheaper Illinois fuels.

The prevailing price f.o.b. mine per net ton is:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$3.25@3.50	$2.50@3.00	$2.50@2.75
3x6-in. egg	3.25@3.50	2.50@3.00	2.50@2.75
2x3-in. nut	3.25@3.50	2.50@3.00	2.50@2.75
No. 2 nut	3.25@3.50	.....	.....
No. 3 nut	3.25	.....	.....
No. 4 nut	3.00@3.25	.....	.....
No. 5 nut	2.50	.....	.....
2-in. screen	2.50	2.25	2.00@2.10
2-in. lump	.....	.....	2.25@2.40
3-in. lump	.....	2.25@2.60	.....
Steam egg	3.25	2.25@2.50	2.25@2.40
Mine run	2.50@2.75	2.25	2.15@2.25
Washed			
No. 1	3.50	.....	.....
No. 2	3.25@3.50	.....	.....
No. 3	3.25	.....	.....
No. 4	3.00@3.25	.....	.....
No. 5	2.50	.....	.....

Williamson and Franklin Co. rate is 87½c. Other fields 72½c.

MILWAUKEE

Public representatives still probing coal costs and profits. Supplies of Lake coal coming more freely, with promise of increased tonnage.

Coal continues to receive a good share of public attention, largely because of the endeavors of civic organizations to reach the cause of present prices, which are pronounced excessive by both dealers and consumers. Government interference can only mean lower prices, and as long as there is talk of such action, thousands of cautious buyers will hold off.

The State Council of Defense is still delving in coal costs. It publicly declares that Illinois coal operators are exacting exorbitant profits. At a recent session an Illinois operator testified that during the past three years coal sold at the mines in that state at from 90c. to $1.10 per ton, f.o.b. cars at the mines. These prices, he said, yielded a reasonable return. Increased wages in 1917 made necessary an advance of 25c. per ton, while higher prices for rails, ties, and other mining incidentals made a further advance of 17c. obligatory. Taking the maximum figure of $1.10 and adding 42c. to cover these two increases, the resultant price would net operators a return equal to that realized during the three former profitable years. The circular with which the State of Wisconsin has been flooded calls for $2.75 for mine-run and $3.50 for assorted sizes, or rates based upon the agreement which has been repudiated by Secretary of War Baker.

Senator La Follette is also taking a hand in the coal probe. He wired the mayors of leading Wisconsin cities asking data concerning the supply of hard and soft coal and for other facts bearing upon the fuel situation. Federal officials who have to do with securing bunker coal for Government dredges and steam craft are likewise trying to find out why coal is higher at Milwaukee, with its excellent harbor, than at less favored points along the west shore of Lake Michigan.

Prices remain at the figures quoted at the beginning of July. It is expected, however, that force of habit, if nothing else, will bring about the usual monthly advance of 10c. per ton on anthracite on the first of August.

Coal is coming forward more satisfactorily and the piles of bituminous at the yards are beginning to assume assuring proportions. Congestion at the iron-ore docks may lead to a diversion of tonnage to the coal trade. Receipts thus far in July by Lake aggregate 477,858 tons, of which 74,003 were anthracite. A 10,000-ton cargo of hard coal was delivered within the past few days.

General Statistics

CARLOAD SHIPMENTS

The following statement of carloads of bituminous coal that originated on 85 railroads and of beehive coke on 16 roads in June, 1917, is compiled from reports received by the Geological Survey, Department of the Interior, by noon July 16, 1917:

	June, 1917	May, 1917	June, 1916
Number of working days	26	26	26
Central Penn., Md., and New River and Pocahontas fields and Va. (11 roads)	186,196	186,249	174,164
Western Penn., Ohio, and Mich. (14 roads)	112,280	110,721	80,425
Eastern Ky. and W. V. (except New River and Pocahontas fields) (11 roads)	173,728	173,101	169,176
Ala., Tenn., and Ga. (5 roads)	13,803	13,287	11,652
Ill., Ind., and Western Ky. (22 roads)	172,335	174,588	93,980
Ark., Iowa, Kan., Mo., Okla., and Tex. (10 roads)	49,627	49,741	34,929
Rocky Mountain States, N. D., and Wash. (12 roads)	42,353	41,479	30,205
85 roads	750,322	749,166	594,531
Carloads of beehive coke (16 roads)	76,079	75,905	72,731

Comparative figures based on reports for June, 1917

The increase in these shipments of bituminous coal in June, 1917, was 1156 cars, or but 0.15 per cent., compared with May, 1917, but was 155,791 cars, or 26.2 per cent., compared with June, 1916. As the three months compared in this statement have the same number of working days, the totals represent the relative changes in rates of production. There were slight increases in June, compared with May, 1917, in the shipments from the Eastern and Southern fields and from the Rocky Mountain States and Washington. Illinois, Indiana, western Kentucky, and the Southwestern States recorded decreases.

NORFOLK & WESTERN

The following is a statement of coal handled by the N. & W. Ry. during June and the preceding two months in short tons:

	April	May	June
Pocahontas	1,397,418	1,498,529	1,543,881
Tug River	293,324	335,890	317,186
Thacker	270,051	286,995	276,037
Kenova	73,404	87,624	87,094
Clinch Valley	130,561	147,600	148,532
Miscellaneous	8,835	14,618	1,547
Total N. & W.	2,173,593	2,371,256	2,374,277
Wlm. & Pond Ck.[2]	133,205	141,880	141,704
Tug. R.& Ky.R.R.	49,073	53,003	52,533
Other roads	367,497	346,982	385,451
Grand total	2,723,368	2,913,121	2,953,965

COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for April and 4 months of 1916-17 were as follows, in short tons:

Classes and Railroads	April 1916	April 1917	4 Months 1916	4 Months 1917
Anthracite:				
Baltimore & Ohio	91,501	175,516	600,135	677,175
Buffalo, Rochester & Pittsburgh	10,066	16,135	59,965	73,335
Buffalo & Susquehanna	337	77	2,624	2,032
Chesapeake & Ohio	704	635	3,842	3,569
Erie	709,841	854,980	3,347,329	3,503,728
Huntingdon & Broad Top Mountain	38	32	135	220
Pennsylvania	766,540	782,163	3,994,058	3,764,399
Pittsburgh & Lake Erie	125	114	257	402
Pittsburgh, Shawmut & Northern	532	758	4,829	4,747
Virginian	148	176	693	1,629
Western Maryland	16,425	33,120	115,056	143,522
Total	1,596,257	1,863,706	8,123,923	8,174,758
Bituminous:				
Baltimore & Ohio	2,661,704	2,887,134	11,292,466	11,328,399
Buffalo, Rochester & Pittsburgh	647,053	777,147	3,214,952	3,107,921
Buffalo & Susquehanna	94,843	110,178	504,289	477,160
Chesapeake & Ohio	2,158,984	2,056,887	8,707,481	8,031,583
Erie	677,924	742,113	3,255,836	2,949,517
Huntingdon & Broad Top Mountain	96,181	118,804	413,884	496,230
New York Central (Buffalo and East)	535,124	659,673	2,854,735	2,842,120
Norfolk & Western	2,617,563	2,438,906	9,687,670	9,158,874
Pennsylvania	3,879,270	4,461,030	16,598,440	17,071,981
Pittsburgh & Lake Erie	793,248	831,293	3,749,620	3,530,364
Pittsburgh, Shawmut & Northern	213,756	93,038	970,315	561,742
Virginian	378,255	500,584	1,810,050	2,105,947
Western Maryland	686,040	702,601	2,623,494	3,170,440
Total	15,439,945	16,379,388	65,683,232	64,832,27

I. C. C. Decisions

No. 7369.[1] Independent Ice, Feed & Fuel Co. vs. San Pedro, Los Angeles & Salt Lake Railroad. Submitted Oct. 30, 1916. Decided May 17, 1917.

1. The present rate of $5.65 per net ton on coal in carloads from the Castle Gate rate group of Utah and the Rock Springs district of Wyoming to points in southern California, including Los Angeles, has not been shown to be unreasonable.

2. On lump coal in carloads from mines in New Mexico to points in southern California, including Los Angeles, a rate of $5.15 per net ton is found to be a reasonable maximum rate for the future. Reparation denied.

No. 8421. West Lumber Company vs. St. Louis & San Francisco Railroad Company et al. Submitted June 26, 1916. Decided May 12, 1917.

Rate on coal in carloads from Greenwood, Ark., and other adjacent points taking the same rates, to Onalaska and Sequoyah, Tex., found to have been and to be unreasonable and unduly prejudicial. Reparation awarded.

No. 7948. City of Clarksdale, Miss., et al., vs. Illinois Central Railroad. Submitted Dec. 24, 1915. Decided June 2, 1917.

Rates on bituminous coal in carloads from Mercer and De Koven, Ky., and grouped points, and from Benton and Christopher, Ill., and grouped points, to Clarksdale, Miss., not shown to have been or to be unreasonable or unduly prejudicial. Complaint dismissed.

Foreign Markets

GREAT BRITAIN

July 12—The coal market is slow, inquiry being restricted.

Fixed regulation prices now are:

Best Welsh steam	$7.92
Best seconds	7.56
Seconds	7.38
Best dry coals	7.20
Best Monmouthshires	7.20
Seconds	6.96
Best Cardiff smalls	5.52
Cargo smalls	4.80

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—We have to report a continued scarcity of tonnage, and a consequent firmness of freight rates in all directions. Quotations are now as follows:

Gibraltar	$21.60	Port Said	$34.80
Marseilles	21.54	Las Palmas	18.00
Genoa	24.30	St. Vincent	19.20
Naples	23.58	River Plate	27.00
Alexandria	40.80		

[1]The proceeding also embraces complaints in No. 8175, Byron T. Rowan et al. vs. Atchison, Topeka & Santa Fe Railway Company et al.; and in No. 8789, Southern California Fuel Dealers' Association et al. vs. Atchison, Topeka & Santa Fe Railway Company.